REVISION -

COMMAND AND STAFF LEADERS GUIDE For AFATDS 6.4.0.0

Contract No. DAAB07-99-C-E003
CDRL Sequence No. N602

28 July 2004

Prepared for:

Commander US Army CECOM
Fort Monmouth, NJ 07703-5008

Prepared by:

RAYTHEON COMPANY
1010 Production Road
Fort Wayne, IN 46808-4106

Revision Status Sheet
For
Command and Staff
Leaders Guide
for
AFATDS 6.4.0.0

Rev.	Date	Description of Change
-	28 July 2004	Original Submittal

HOW TO USE THIS MANUAL

Conventions used in this publication. The focus of this document is on providing general information to those who are not AFATDS operators, but are involved in Fire Support. It is not procedure oriented. However, more details and limited procedures may be found in the appendices.

ABSTRACT

AFATDS (Advanced Field Artillery Tactical Data System) is a tool. This tool fills the automated C3 (Command Control and Communications) system role for the fires battlefield functional area. It assists in managing operational and tactical fires in support of the maneuver as well as provide technical control of firing elements. It provides the commander with integrated, responsive, and reliable fire support. AFATDS is a fully automated fire support system, which minimizes the sensor-to-shooter timeline and increases the hit ratio. It provides fully automated support for planning, coordinating and controlling mortars, field artillery cannons, rockets, guided missiles, close air support, attack helicopter and naval gunfire, for close support, counterfire, interdiction, and deep operations. The system is used at all echelons from the platoon operations center to the corps fire support element. It operates with all existing and planned US fire support systems as well as allied field artillery C3 systems such as ADLER, ATLAS and BATES. AFATDS runs on the Sun Solaris operating system. AFATDS is written primarily using ADA programming language but also contains a large number of Java and C++ components.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

(This page intentionally left blank.)

1. AFATDS OVERVIEW

1.1 Introduction

The Advanced Field Artillery Tactical Data System (AFATDS) is a tool. Just as a hammer makes putting nails in a board a lot easier than pounding them in with your fist, so AFATDS makes Fire Support a lot easier to accomplish. AFATDS is a fully automated Command and Control (C2) system that prioritizes targets and pairs them with optimal Fire Support weapon systems. It gives commanders timely, accurate, coordinated fire support to prosecute high-value targets. This is enhanced by color-coded missions status, unit status, and map displays for ease of use.

Although it is highly automated, AFATDS allows for human intervention, whenever necessary. The system does not force current doctrine, but supports it. Commanders' Guidance is factored into each mission. Options and recommendations are given to the operator for each mission processed, based on rule sets input by the operator. Tailorable rule sets are available for target processing, weapon pairing, information distribution, and communications redundancy.

Unit relationships may also be tailored in real time to adapt to changing needs. The system provides agility, allowing for the establishment of the sensor to shooter link while ensuring mission coordination needs are considered.

Fire Support Areas Which AFATDS Supports

1. Fire Support Planning. Fire Support Planning provides integration of field artillery, mortars, naval surface fire support, aviation (helicopters), and air support into the Force Commander's scheme of maneuver. AFATDS helps create a Fire Support annex to the commander's Operation Plan (OPLAN) and a Field Artillery Support Plan.

2. Fire Support Execution. Fire Support Execution is guided by fire support and field artillery support plans. It performs sensor employment, target processing, attack systems analysis, technical fire direction for cannon units, tactical fire control for MLRS units, and target damage assessment.

3. Movement Control. Movement Control manages and coordinates the movement of field artillery units and sensors and coordinates the movement of fire support units and sensors.

4. Field Artillery Mission Support. Field Artillery Mission Support includes functions logistically supporting the field artillery system. It creates and maintains supply inventory files, supply requests, and supply reports.

5. Field Artillery Fire Direction Operations. Field Artillery Fire Direction Operations includes the collection and maintenance of weapon, fire unit, and ammunition status data required for day-to-day operations. This information is provided in either detailed or aggregate form to appropriate Operations Centers in support of both planning and execution requirements.

AFATDS and the Map software, which the system uses, provide critical Situation Awareness (SA). Both friendly and enemy unit graphics are displayed, along with target information from multiple sources. Due to the multi-level communications across the network, unit status, and weapon platforms are monitored and updated continually on the map. Unit information may be directly accessed from the map symbols. Friendly units, enemy units, targets, and areas of responsibility can all be seen. At each AFATDS box, the operator may filter the information to be displayed, thus allowing the commander to monitor the dynamic current situation, missions processing through the system, and target updates from his needed perspective.

1.2 AFATDS Communications

Figure 1, AFATDS is not limited to Field Artillery communications, but can communicate with Air Force, Marine, Navy, and NATO systems. AFATDS is interoperable with all fires subsystems including GDU, AFCS, FCS, Firefinder Radar, ATHS, and FOS. It interoperates with the Army Battle Command Systems (ABCS) suite including ASAS, MCS, FAADC2I, and BCS3. The system also interoperates with Joint level automated systems such as TAIS, TBMCS, JSTARS, GCS, and JMCIS. AFATDS also interoperates with BATES, ADLER, and ATLAS, which are NATO systems

AFATDS communicates around the battlefield using the programmable Tactical Communication Interface Module (TCIM) or the SPTCIM. This enables the communication over Wire (2W/4W), Combat Net Radio (CNR), Mobile Subscriber Equipment (MSE), and the Enhanced Position Location and Reporting System (EPLRS). The system also uses a Network Interfaced Card to talk over LAN for SIPRNET/NIPRNET operations.

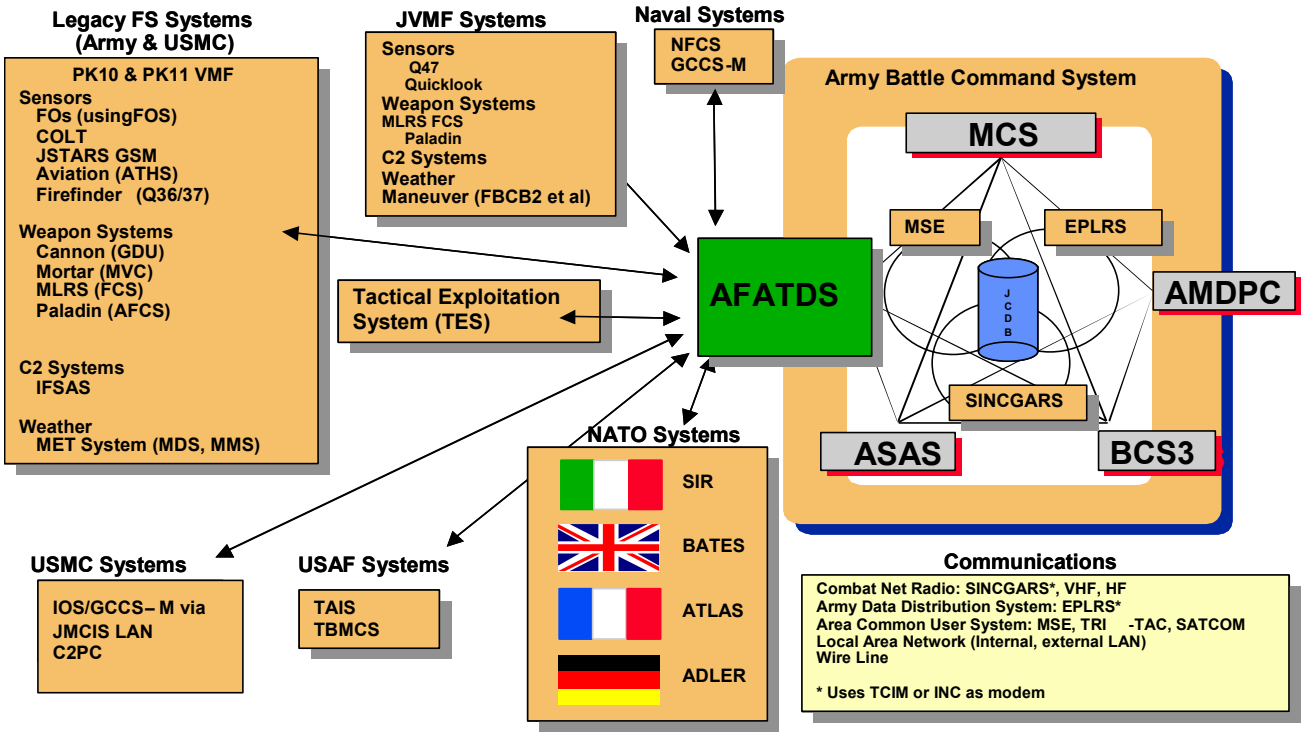

Figure 1. Communications Interoperability

1.3 AFATDS Planning

The planning function within AFATDS allows for detailed planning and Course of Action (COA) analysis by projecting friendly and enemy positions, guidance specific to the plan, and a task organization for the plan. In order to assist with the planning function, an enemy template tool is provided. A system tool supports multi-phase maneuver COAs and can compare and

recommend the best COA considering commander's priorities. Plans can be easily disseminated. The planning activity does not affect the current situation until the operator implements the plan. Plans are implemented into current by phase - this immediately updates the UTO, guidance, geometry, and target database to reflect changes.

1.4 Target Analysis and Engagement

Target Analysis and Engagement is a very robust aspect of AFATDS as shown in the automated assistance in target list management which allows for copy and merge functions, target duplication checks, sorting, searching, and target data reception and transmission. Schedule of fires may be calculated. There is an extensive set of targeting guidance that can be applied (Target Selection Standards, High Payoff Targets, Decay time, target prioritization etc). From intelligence reports and directional information, targets can be automatically generated. Pre-planned missions can be linked to sensor reports for time sensitive targeting.

The system can deal with many weapons and pair those weapons to targets, minimizing the timeline for the sensor to shooter thread. The system can filter sensor reports so that every report doesn't have to be engaged, and the system also selects the best weapon and munition based on Target parameters (environment, countermeasures, TLE, age etc.), the munitions required (effects capability, hazard area etc.), and weapon status (response time, current mission load, ammunition inventory etc.).

Managing missions from start to finish, the system can handle 720 sensor inputs per hour. Processing sensor inputs, the system considers mission value, not first in - first out. As the system processes sensor data, it applies Target Selection Standards (TSS) and Commander's targeting guidance. This filters low value targets. The system analyzes cannon, mortar, rocket, ATACMS, fixed and rotary wing air, naval cannon, standard missile and tomahawk as possibilities for weapons. It coordinates ground and airspace violations, (spatial coordination is 4D, including time analysis), is fully automatic and keeps interested nodes appraised of targeting information. The system considers commanders' guidance, latest unit status, mission history, and effects algorithms, which determine munition quantity for both smart and conventional munitions. During the mission processing, the operator may view and tailor the system recommendation. The intervention display shows all key data and analysis results.

2. THE AFATDS SOFTWARE PACKAGE

2.1 AFATDS Software and Operating System

The AFATDS software loads CD ROMs automatically, configure and load AFATDS software, as well as loading all necessary components of the operating system and supporting programs. The load process requires no operator interaction aside from providing the IP address and hostname for the computer's permanent LAN. The AFATDS software load is unclassified when loaded. Adding munitions effectiveness data and operational information may require the operator to first upgrade the security classification but this is not required to operate the system. The components of the software load are as follows:

AFATDS operates on the Sun Solaris operating system (Version 8 2002). Solaris is a form of UNIX OS (operating system). UNIX is used because it offers a stable OS that is less prone to intrusion from external sources.

The AFATDS operator requires no knowledge of the operating system since all OS setup is either automatically accomplished at software loading or during the AFATDS software's configuration of network interface based on operator inputs on windows provided.

2.2 The Common Operating Environment (COE)

The Common Operating Environment (COE) is software that provides a desktop and services for AFATDS and other programs. It is designed to cut program costs by providing a core of common services. It is also designed to make life easier for operators by giving the same look and feel across multiple programs.

- AFATDS application software: AFATDS application software interacts with the Solaris OS and COE to provide fire support and fire direction capabilities.
- As with a lot of the software, which gets loaded on a computer, loading AFATDS provides a number of additional programs such as:
- Star Office: a Sun office product providing word processing, presentation and spreadsheet capabilities. Star office can use and save documents in MS Office formats.
- Snapshot: provides screen capture capability.
- NATO Armaments Ballistics Kernal (NABK): government provided ballistic computation segment that provides computational support for cannon technical fire direction.

2.3 Maps

2.3.1 Joint Mapping Tool Kit (JMTK)

The government requires AFATDS to use as its' map software the Joint Mapping Toolkit (JMTK). This software provides all mapping and symbol display as well as all map manipulation and functions. The (JMTK) is National Imagery and Mapping Agency (NIMA) support software for Mapping, Charting, Geodesy & Imagery (MCG&I) in the Global Command and Control System (GCCS). JMTK provides the basic capability to import and visualize user data over map and image backgrounds, embedded within user mission applications, making the results interoperable. These commercial solutions can provide more robust analysis, image manipulation, and terrain visualization. Linked to JMTK, the results of these analyses remain interoperable when shared with other users and mission applications. The JMTK functionality includes Symbol Generation (using MIL-STD 2525 symbols and software developed by the Army Space Program Office), and the ability to utilize standard NIMA digital map products.

2.3.2 Handling Location Information

AFATDS and the Joint Mapping Toolkit (JMTK) process, display and transmit location information differently, dependent on the Map Datum configuration in the AFATDS Map Setup as well as on the individual unit's General Unit Information screens or using the JMTK map for location information.

AFATDS stores, in its' database, all location information in a Lat Long format using the WGS-84 Datum. When AFATDS sends location information between AFATDS, PKG-11, USMTF and

JVMF systems the information is sent in a Lat Long format using WGS-84 Datum. Those systems accept and process the location info in the same format as AFATDS.

The JMTK map display that is used in AFATDS, as well as all ABCS systems, can only display location information using the WGS-84 Datum. When you slide the cursor over a unit icon and the location is displayed, from the map, regardless of UTM, Lat Long or MGRS format the WGS-84 Datum is used.

Location information can be displayed on the screens that the operators use to enter and view location information (i.e., Targets, Unit's, Geometries, etc.) based on other Datum's. For example, if the unit decides to use Map Datum North American 1927 and enters that in their AFATDS map setup whenever a location is displayed, cut and pasted or typed in the location fields the system will display that in the correct format. That way, when the unit uses a map or receives locations from other sources using a map with the North American 1927 datum, the conversion will work correctly.

If you are working with PKG-10 or NATO systems (ADLER, ATLAS, SIR or BATES) you must setup the appropriate DATUM in the individual unit(s) Basic Unit Information screens. This tells the communications software in AFATDS that when a location is received or sent to those units, it is received or must be sent in that Map Datum.

2.3.3 ARC Digitized Raster Graphics (ARDG)

ARC Digitized Raster Graphics (ADRG) are maps that are actually 24-bit images in a special format, which are distributed on Compact Disks. The National Imagery and Mapping Agency (NIMA) in the United States originally produced the ADRG maps. The ARC system divides each hemisphere into nine zones of ten degrees of latitude to minimize distortion. The ADRG uses a rectangular coordinate projection based on the datum of the World Geodetic System 1984 (WGS84). The primary sources are conventional map sheets dated from 1984 to 1991, based on the National Topographic System (NTS). The geographic data sets made by scanning these maps are then presented as distribution rectangles. Each distribution rectangle may contain one or more data sets. The group of distribution rectangles in a series at a specific scale is the equivalent of a seamless world database of geospatial raster data in which each pixel has a distinct geographic location (georeferenced data). The main purpose of these data is to serve as a display background.

NOTE

Raster Maps, when compared to vector maps, are suitable for special use. For example, when you want to explore into features not covered in vector maps, such as vegetation, mountain top names, labels on maps and others. Raster data is a rectangular picture of something made up of many tiny colored dots which, when viewed together, looks like a smooth, cohesive picture to the human eye. Television and computer screens are good examples of a raster of colored dots, which define a picture for your eye. A raster format product is sometimes considered a dumb map because it is a picture of a map. NIMA produces several raster data formats; ARC Digitized Raster Graphics (ADRG), Compressed ARC Digitized Raster Graphics (CADRG), and Controlled Image Base (CIB) are the most common.

2.3.4 The Controlled Image Base (CIB)

The Controlled Image Base (CIB) is a dataset of orthonormalized and rectified grayscale images. CIB data are derived directly from digital images, and are compressed and reformatted to conform to the RPF Standard. These maps are also distributed on CDs that are available for use with the system.

2.4 Common Message Processor

The Common Message Processor is government furnished software that provides support for freetext messaging, and creation and reception of other message types that are displayed for operator review. When a version of AFATDS software gets released for use, the following paragraphs (2.5 – 2.7) describe the additional CD ROMs that are provided.

2.5 Joint Master Unit List (JMUL)

The JMUL is a COE segment that is loaded onto the AFATDS computer using the COE segment installer, which is much like the Add/Remove Programs utility on an MS Windows PC. The JMUL acts as an “address book” of units and systems with which the AFATDS operates. Because AFATDS must communicate with a number of external systems that use several different protocols, and because each protocol uses a different method of identifying a unit, the master unit list acts as “look-up” to compare received information and determine to which that information applies. Since a large portion of the US Armed Forces organization remains constant, an updated master unit list of joint and coalition forces is created for each AFATDS version. This is the JMUL. When the JMUL is loaded onto AFATDS, it becomes a Master Unit List (MUL) for the system.

2.6 Maintenance and Utilities

The Maintenance and Utilities CDROM is the only software provided that is classified above the UNCLASS level. Maintenance and Utilities is classified as a secret segment because it provides Joint Munitions Effectiveness Manuals (JMEM) and Loadable Munitions Modules (LMM). JMEM data provides munitions effectiveness data used by AFATDS and LMMs provide missile effectiveness, flight characteristics and data for automatic construction of air space hazard areas associated with employment of missiles.

2.7 Effects Management Tool (EMT)

The EMT software provides the ability to access data from the AFATDS current situation database. EMT also allows the movement of units and creation of FSCMs and graphics on the AFATDS. EMT has additional capability that is not resident in the AFATDS application such as import and export of database information (FSCM’s, targets data, etc) to MS Excel spreadsheets and processing capability such as checks of fire missions and targets against the no strike list.

The Effects Management Tool (EMT) is a client for the Advanced Field Artillery Tactical Data System (AFATDS) jointly developed by the US Army and the US Marine Corps. The EMT serves as an intuitive and easy to use display and entry device for the Host AFATDS to which it is connected. EMT reads information from the AFATDS database and shows this information on a digital map display. This allows the display of unit symbols, battlefield geometries, fire support coordination measures, and target symbols. The EMT allows for data ‘drill down’ on the objects to interrogate them and display information maintained within AFATDS. EMT also displays the firing vectors for active missions being processed in AFATDS. The client operator performs specific tasks and is ‘shielded’ from the other AFATDS functions and AFATDS administration.

EMT collectively consists of a number of software applications that interoperate to provide EMT Functionality. The EMT application is written primarily using the java programming language. The EMT is platform independent and will run on a number of Operating Systems including Windows NT 4.0 SP6a, Windows 2000 SP2, and Sun Solaris. The EMT also makes use of some XML components.

2.8 Map Display Applications

The EMT Application does not independently display information on a computer screen, but rather makes use of one of two map display applications. These applications are the Joint Mapping Tool Kit, which was previously mentioned and the Command and Control PC, below.

2.9 Command and Control For The C2PC

Command And Control For The PC (C2PC): Developed by Northrop Grumman for the US Marine Corps since 1995, Command and Control for the PC (C2PC) is fundamental to systems transmitting or receiving the Common Tactical Picture (CTP) or Common Operational Picture (COP) in a Windows environment. It is an optional network client solution for systems based on Northrop Grumman’s COTS C4I product, ICS. When operating with C2PC, EMT does not share data with the C2PC network, but injects data directly into the C2PC map display. This allows C2PC data and EMT data to be displayed on the same map display at the same time.

2.10 AFATDS Application Server (AAS) Emulator

The AAS emulator provides a training utility by emulating a connection to an AFATDS AAS. This allows for the EMT to run on a computer without being connected to an actual AFATDS. The user will be able to perform functions like: Initiate Fire Mission, Create/Edit/Delete Geometry, Move Units, and View Information.

2.11 AFATDS Versions

The following versions of AFATDS software have been fielded or released for testing

Version 6.4.0.0 is the latest release version and scheduled for release in May 2005.

Any versions in the series Version 9.2 (followed by a letter, e.g., 9.2.M) are developmental engineer builds. These sometimes are found in active units as residuals of testing. Under no circumstances should an engineer build be used for actual operations beyond authorized and controlled testing.

Version 6.3.2.0 is to be replaced by version 6.4.0.0.

NOTE

A unit that uses one version of software cannot effectively and reliably interoperate with units using another version. A stopgap measure is to have the AFATDS that interface, using different versions, to define the system type of the opposite AFATDS as a package 11 System (a system that employs package 11 messages for information exchange). This allows the exchange of information but to a much lesser degree than normally expected between AFATDS.

3. OPERATIONAL ASPECTS

3.1 Guidance

In AFATDS commanders may put in their preferences regarding a multitude of situations, from what type of munitions to use on what type of targets, to what units should be used in what situations. These and many other preferences are considered commanders guidance. Even though the plural of one item of guidance is still guidance, the term in Fire Support circles for this set of preferences is called Guidances. Some Guidances are merely record keeping tools, others allow the information to be placed into a written plan (e.g., an OPORD or FS Annex) and others are used when processing fire missions to determine HOW and WHEN to attack targets.

In AFATDS, there are Target Categories. Within each target category there are Target Types. Many systems, such as IFSAS, call these the Target Type and Subtype instead. Many of the guidances in AFATDS will allow you to specify guidance for each individual target type. When a call for fire is received at AFATDS for processing, the target type of the mission is used to find what specific guidance has been given for that target type.

Of those guidances used in processing fire missions, some are called Filters. These filter guidances determine if the target should be shot or not. For example, if the target is a duplicate of another target, we need to eliminate the second call for fire; the Target Duplication guidance will filter these types of targets out.

Some guidances are used to determine how or when to shoot the target. They allow targets to be prioritized relative to one another as well as provide information on what kinds and volume of munitions or what effects to use on the target.

Other guidances are considered Preferences. For these, the entry you make will not necessarily be the solution provided for a fire mission as other information may be taken into account as well. For instance, when shooting a certain target type, your preference may be to shoot it with DPICM, TIME, and 2 PLT volleys. But if no units have DPICM, other shell/fuze combinations will be chosen. If available, alternatives will be given, but your preference may be ranked higher than other alternatives and may in fact be the suggested option. Preference guidances allow blank entries to be made; for these guidances, blank entries just mean No Preference.

3.2 Fire Mission Processing

First of all AFATDS receives fire missions as calls for fire, Tactical Air Requests (TARs) or Artillery Target Intelligence (ATI) information. These usually arrive at an AFATDS workstation digitally, through a network, as Fire Requests (FRs). The operator responding to a voice call for fire may also input calls for fire manually. Once it’s in the system, it’s a Fire Mission.

Tactical Air Requests (TAR): TLDHS and some other systems can send a TAR message to AFATDS for an immediate Close Air Support (CAS) request. This message is processed in the same manner as a call for fire message.

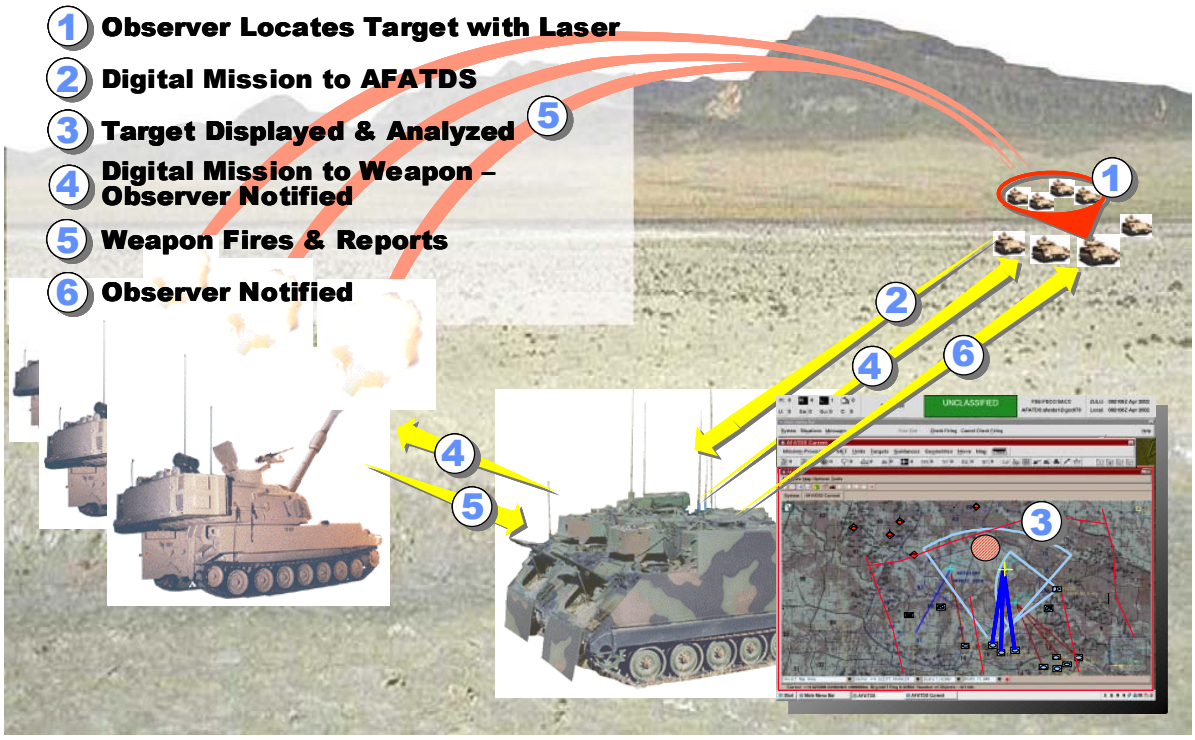

Figure 2. The Digital Mission

Artillery Target Intelligence (ATI): ATI messages provide target information. These are processed by AFATDS based on commander's guidance. Commander's guidance provide a rule set that define, among other things, how to process ATI data. ATI data is handled using the following process:

The ATI target is checked against the currently effective target selection standards (TSS) guidance, if the operator has selected that option for processing. If the target is not sufficiently accurately located or too old, the target data is stored in the AFATDS Suspect Target List for potential refinement by future, supporting reports. If the target passes TSS guidance checks, the target is further evaluated.

Upon reception of the Fire Request, AFATDS will store the data, determine the mission precedence (priority), determine the Battle Area (the geometry where the target is located), and check and react to additional data related to certain missions. Those missions are Quick Smoke missions, Time on Target (TOT) missions, and Moving Target Missions. For targets passing the TSS check, the target type is next checked against the high-payoff target list. If the target type is not a high payoff target, the target is stored in the AFATDS inactive target list an no further automatic processing is performed except to perhaps purge the data when it is too old to be valid (if such purging is "turned-on" by the AFATDS operator).

If the target type is found on the High Payoff Target (HPT) list, the target is further processed to determine when it should be attacked as indicated on the HPT list. Planned Targets are added to the AFATDS Planned target list for future inclusion into fire plans. Targets designated to be attacked "as acquired" or "immediately" become unobserved fire missions.

3.2.1 Target Filtering

Target data is checked during fire mission processing to ensure it is actually valid as a fire mission. Failing a filtering check causes AFATDS to evaluate fire support and produce solutions but causes AFATDS to recommend denying the mission. Final Protective Fires (FPF), Copperhead priority targets, registration missions and missions employing special munitions such as FASCAM always pass filter checks. (AFATDS allows an override of any of its recommendations.) The following checks apply.

3.2.2 Target Selection Standards

This check is “turned-off” by default but can be enabled by the operator. If enabled, this check requires the target meet accuracy (target location error) and age checks to be valid. The Target Location Error (TLE) checks if the TLE is less than or equal to the maximum acceptable TLE. The sensor’s TLE is extracted from Detailed Unit Info or may be a default value. This is then compared to the TLE for the target type. Max Report Age checks to see if the age of the report is less than or equal to the maximum acceptable age for the given target type. The Current Date ‘Time Group (DTG) is compared to the DTG when the target was acquired and then to the Max Report Age for the target type. Comparing the information in the sensor’s detailed unit information window checks reliability. The check determines if the sensor is reliable for the target type. If a target fails the TSS, it is sent to the suspect target list.

3.2.3 Target Duplication

This check evaluates the target against other fire missions currently active to determine if the target is close enough and sufficiently similar to be classified as a duplicate of the established fire mission. (A discussion of target duplication can be found in Appendix H under Suspect Target Processing.)

3.2.4 Target Build-up

This check examines the target against target build-up area geometry in the database. The objective of the geometry is to cause mission to be denied until a desired density of targets has appeared in the build-up area.

3.2.5 Not Later Than (NLT) Time

Each processed target has a decay time applied based on the target type. Target decay time is established, by target type, by the AFATDS operator in guidance. The decay time is added to the time the target was acquired to determine a NLT time. The target must be able to be engaged prior to the expiration of the NLT time.

AFATDS ensures that a Target Number is assigned. If mission was received (or initiated from the keyboard) with a target number, the target number will remain with the target. If the mission was received (or initiated from the keyboard) without a target number, AFATDS will assign a target number from its own target block. The Excluded target filter check compares the target type of the current target to the Excluded Target guidance (TMM) to see if the target type has been excluded. If the target type is excluded, the mission is “flagged” and processing continues with the next filter check.

If the CURRENT target lies in Target Build-Up Geometry, the target will fail this filter if the strength of this target and the sum of previous targets (of the same type found in this geometry) is less than the “trigger” established in the Geometry. IEW Routing determines if the target must be coordinated with IEW (ASAS) prior to attack. It also checks the target type with the Target Management Matrix (TMM) to determine if this target type is flagged for IEW routing. If IEW is checked on any target in the TMM, an entry in Mission Info Routing must be made to provide AFATDS with the unit ID that the coordination request will be forwarded to. There is a check for preferred Mission Routing. If the mission is an Immediate Suppression or Immediate Smoke, the mission is checked against Mission Routing guidance to determine the ID of a unit if specified and capable. This guidance speeds the attack of these targets by bypassing processing at intermediate OPFACs.

As each mission is processed, AFATDS calculates and assigns a Mission Value to that mission between 0 and 100. The value is used to rank order the missions in queue and determine which fire support system is used to attack that particular target.

The systems uses four separate target attributes to determine the values which are weighted and combined to determine the overall mission priority. The values are as follows in Figure 3:

$\frac{\text{Greatest HVT LIST window value + (TMM window HPT value)}}{2}$	=	Target Type Value for High Payoff Targets
$\frac{\text{(HV LIST window value)}}{2}$	=	Target Type Value for non High Payoff Targets
$\frac{100 \times [(\text{Value of POF rank} + 1) - \text{POF Rank of the originator}]}{\text{Sum of all POF ranks in the Mission Prioritization window}}$	=	POF Value
$\frac{100 \times [(\#\text{ of TAI ranks} +1) - \text{TAI rank if tgt plots in TAI geometry}]}{\text{Sum of all TAI ranks in the Mission Prioritization window}}$	=	TAI Value
On-Call Value is always zero (0) unless the "on-call targets have higher priority" box is checked on Mission Prioritization window. If the box is checked and the target is an On-Call target, the value = 100 If the box is checked and the target is not an ON-Call target, the value = 0		

Figure 3. Calculating Inputs for Fire Mission Value

Weights are assigned, in the Mission Prioritization window. The value of each weight is used as a multiplier to the value as calculated in Figure 3. The values are added together. The result is the Fire Mission Value.

(Target Type Value) x (Target Type Weight) = ?
(TAI Value) x (TAI Weight) = ?
(POF Value) x (POF Weight) = ?
(On-Call Value) x (On-Call Weight) = ?
Fire Mission Value = ?

Figure 4. Calculating Fire Mission Value

AFATDS will then assign an “Operational Until Time” for the mission. The Operational Until time is determined by adding the Target Decay Time guidance for the mission target type to the DTG that the mission was received (or initiated from the keyboard). If the target is not attacked within this “window of time”, the target will “time out” and AFATDS will recommend that the mission be denied. A Fire Support Coordination Measures (FSCM) check determines if there is a need for coordination of the fire mission. The Fire Support Buffer Distance guidance is applied to the target during this step.

3.2.6 Attack Analysis

Once a target passes all of the filters and checks in target processing, Attack Analysis begins. There are three (3) levels of Attack Analysis. The level used on the target is dependent upon which level of Attack Analysis the OPFAC utilizes. Detailed Attack Analysis is the default level the system uses if your OPFAC is the FA CP/FDC (BTRY/PLT). It is also the most complex analysis performed and requires complete Fire Unit information. An OPFAC utilizing Detailed Attack Analysis must have up to date information on all fire units considered. In Detailed Attack Analysis, AFATDS looks at individual fire units to make an assessment of their capability to attack the target (either as a single unit or as part of a massing option). The system checks to determine what fire units are available for consideration. It adds these to the Available Unit List. Once available units are identified, it further refines the list to the available fire units meeting capability criteria. The capable units are added to the Working Unit List. From the Working Units List, the system will eliminate the selection of units, which are not capable of supporting the mission due to location, lack of capable munitions, not being in range, etc.

The system will then develop attack options by pairing capable working units with munitions. A capable option is sought by determining if the unit has capable munitions, could meet the response time, effects requirements, response time, and has enough of the right munitions to perform the mission. If a capable option is found, AFATDS stops attack option development and makes no more passes through to find available options. When more than one capable attack option is generated as a result of a check, the options is ranked per the Attack Option Ranking Criteria. Those criteria can be operator specified according to Fire Support System Tasks, Mission Characteristics, the Unit Load, and Shortest Range Capable Munitions.

As the system makes the first pass, it may find that there are no capable options. It will then go back through the process looking for new pairings. It will continue that process until it finds a capable attack option or has exhausted all possibilities. AFATDS provides the option to interrupt mission processing after attack options are ranked, if the mission meets currently established intervention criteria. This permits the operator to review target processing and attack option-processing results and either accepts the processing actions specified in the recommendation or select an alternative action. The Unit Attack Analysis level is designed primarily for units that are FA CP/FDC's (Arty Regts/BN FDC) that command FA CP/FDC's (BTRY/PLT)). This level does not require complete FU info but does require "Unit Roll-Up" information. In the past, all FA CP/FDC's performed Detailed Attack Analysis on all fire missions. This created a duplication of effort to perform Detailed Attack Analysis at all FA CP/FDC's. In order to help streamline the process and eliminate the effort duplication, Unit Attack Analysis was created. It is based on the concept that FA CP/FDC's that control fire units would still perform Detailed Attack Analysis. FA CP/FDC's that control FA CP/FDC's will now perform Unit Attack Analysis.

An OPFAC utilizing Unit Attack Analysis does not need detailed unit data of the guns in his database. What is required is the number of guns ready to fire per unit (i.e., 6 guns ready to fire). Instead, the subordinate FA CP/FDC to the OPFAC utilizing Unit Attack Analysis transmits a "unit roll-up". This "Unit Roll-Up" provides enough information to the OPFAC to perform Unit Attack Analysis.

In performing Unit Attack Analysis, AFATDS looks for supporting or subordinate FA CP/FDC's and fire units. Those supporting or subordinate Fire Units will be analyzed using Detailed attack analysis and the Subordinate FA CP/FDC's will be analyzed using Unit Attack Analysis. Unit Attack Analysis is similar to Detailed except for the way that units are selected. Only Subordinate FA CP/FDC's are analyzed with Unit Attack Analysis. The FA CP/FDC's are determined capable if all of the following conditions exist:

- The FA CP/FDC's roll-up data has at least one range fan that covers the target.
- The FA CP/FDC's response time and current time is before the NLT/Operational time for the target.
- The FA CP/FDC is not saturated with missions from your OPFAC.
- The Mission Cutoff value (Mission Prioritization guidance) must be met or exceeded by the current missions assigned Mission Value.

- The FA CP/FDC must have the specified munitions on hand (per ammo summary data in the CP Ammunition Roll-Up).
- The selected munitions cannot be restricted in the FS Tasks Matrix.

The FS System Attack Analysis level is the least complex and is designed primarily for all FSE/FSCC's. This level is the default level of Attack Analysis if the OPFAC is an FSE/FSCC and also helps speed processing.

- A Fire Support System is capable when the following conditions exist:
- A Unit ID is entered in the FS System Attack Parameters for the given FS System.
- The target is within the range area specified for the FS System.
- The FS System response time and current time is less than the NLT/Operational time of the target.
- The number of missions that you have sent to the unit ID is less than the saturation level specified for that system in the Attack Parameters Guidance. The Mission Cutoff value (Mission Prioritization guidance) must be met or exceeded by the current missions assigned Mission Value.
- System and tested munitions cannot be restricted in the FS Tasks Matrix or FS Munitions Restrictions.
- Unit/Munitions pairings in FS System Attack Analysis are the same as in Detailed and Unit Attack Analysis.

4. HARDWARE

The CCU2 is a ruggedized computer that combines all components into a single cabinet. The CCU2 is fielded to both the USMC and US Army and is found in shipboard Supporting Arms Coordination Center (SACC) configurations. All AFATDS versions since A98 are supported on the CCU2.

The Tadpole is a UNIX laptop that is supported beginning with AFATDS version 6.3.2.0 and newer. This provides the compact size of a laptop. It should be noted that CCU2 and Tadpole software are not interchangeable.

5. INFORMATION MANAGEMENT

The AFATDS database is blank when software is loaded. The database is normally constructed prior to operations. At a minimum, the following data needs to be entered:

5.1 Minimum Database Entries

Map Setup Establishes the focus of the map, its scale and what overlays (data filtering) are used to display units, targets, etc. A default overlay called SOP can be used, though operators should tailor more detailed filtering.

Map Mod The Map Mod establishes an area within which short UTM coordinates can be entered and establishes the map datum for conversion of coordinates.

Own Unit Data The data of the local unit is entered. This data is transmitted to other systems during operations to assist in creation and maintenance of a common operational picture (COP).

Communications Configuration contains network information as well as routing and address information for the units with which the local AFATDS communicates.

Target Decay Guidance Though AFATDS supports numerous commander's guidance, the minimum required to process fire support is called Target Decay Guidance. This guidance provides a number of minutes after acquisition that a target remains valid. The guidance defaults to 0 minutes, requiring an entry by the AFATDS operator.

Target Number Block The AFATDS requires a block of NATO-type target numbers for the processing of target data and fire missions. These are assigned to any target data entered or received digitally and not already assigned a target number.

5.2 Master Unit List (MUL)

Master Unit List Capabilities: While targets are the focus of operations from a broad perspective, the Master Unit List (MUL) is an information foundation for AFATDS operations. It starts out on a CD provided with the other software as the Joint Master Unit List (JMUL). Once loaded onto the hardware, it is the MUL. The MUL is the holder of all unit information. This includes enemy units as well. Before a unit can exist in a situation, whether it is "Current" or a "Planned", the unit must first exist in the Master Unit List. The MUL is also used to perform a variety of communication functions, such as managing network-related communications parameters, and supporting communications-related display screens associated with the Comm. Administrator duty.

The Master Unit List (MUL) supports the processes of the current or planned situations for AFATDS databases. This provides the capabilities to maintain information of friendly units; maintain information of Enemy units; coordinate the development and approval of friendly unit movement orders; maintain Class III and Class VII summary data (AFATDS/CMP messages); create sensor task orders; maintain unit characteristics data; generate reports; provide graphical display of the unit information; display unit symbols on the screen display; provide an operator interface to create and maintain this information. The MUL interfaces with other processes to provide for the automatic distribution of this information to other units.

The MUL controls and monitors external communications based on the units in the list. During startup, it creates or updates a "Preconfigured LAN" subnet if a configured and enabled motherboard LAN is detected. During startup, it updates routes contained in the current communications configuration with Current Situation units via the "Preconfigured LAN" subnet using C2R and DNS data.

AFATDS OPFACs may Start and Initialize their systems with a database that includes the Master Unit List (MUL) in order to perform the selection and use of the units within the list. A second option is to power-up the system with absolutely no database information and to create a MUL with the preferred unit information. With the second option the AFATDS would be activated using a NULL database.

In AFATDS data is stored using the Unit Reference Number (URN) assigned instead of Unit ID. This allows OPFACs to exchange Unit data correctly without requiring the Unit IDs to be displayed exactly alike at both OPFACs. On the other hand, it REQUIRES Unit Reference Numbers to be the same between ALL AFATDS OPFACs which will exchange Unit data.

6 AFATDS SECURITY

6.1 Passwords

The Information Assurance Manager (IAM) has the responsibility for management of passwords. Passwords are required as a user validation function. Passwords are issued by the IAM to each authorized user for use by that individual user and no other. AFATDS will initially be fielded with a default password to allow a designated the IAM to initially logon and thereafter establish user accounts. Sharing of passwords and otherwise divulging a private password to another user that is not authorized its use, as assigned by the IAM, is a serious breach of security. AFATDS Client/User creation, privilege assignment, and password control is determined the AFATDS System Administrator.

6.2 COE Security Administrator Functionality

Security Administrator functionality provides the ability for authorized users to create, delete, and maintain user accounts and groups, as well as define profiles that provide users with easy access to the executables and icons they need to perform their duties.

6.2.1 Profiles

A profile provides a mechanism by which a Security Administrator can group sets of users, often by their job responsibilities. Rather than assigning each user a list of applications they are allowed to access, the Security Administrator can define a profile that provides convenient access to a series of applications, and then assign users to one or more profiles. For example, the Security Administrator may create a profile called GCCS User, which would contain all of the applications that a typical Global Command and Control System (GCCS) user would need to access. The administrator could then assign this profile to one or more user accounts. Similarly, the administrator could create a profile called Backup that would provide access to the applications needed to perform a system backup. This profile could again be assigned to one or more user accounts.

6.2.2 Account and Profile Manager (APM) Client Functionality

The APM client application provides functionality for managing user accounts, groups, profiles, and hosts within the network. The APM client manages global account and profile information by communicating with the APM master server within the administrative domain. In addition, the APM client manages local account and profile information by communicating with the APM master server running on the local machine itself.

A summary of operations that can be performed by the APM client is given below.

User Accounts

- Assigning and changing an account's user name
- Assigning and changing an account's password
- Optionally assigning a User ID (UID) to a new account
- Assigning and changing an account's default group
- Assigning and changing an account's comment
- Assigning and changing an account's login shell
- Assigning an account's home server
- Assigning and changing an account's list of group memberships
- Assigning and changing an account's list of profiles
- Assigning and changing an account's list of hosts

NOTE

A new user account's home directory is automatically determined by APM.

Groups

- Assigning and changing a group's name
- Optionally assigning a Group ID (GID) to a new group
- Assigning and changing a group's list of users
- Assigning and changing a group's list of hosts

Profiles

- Assigning and changing a profile's name
- Optionally determining whether the profile is lockable with the use of a profile locking segment
- Assigning and changing the list of features available to a profile

Hosts

- Assigning and changing a host's name
- Assigning and changing a host's description
- Assigning and changing a host's Internet Protocol (IP) address
- Assigning and changing a host's alias list
- Assigning and changing the function of a host
- Selecting the domain to which the host belongs

6.2.3 C2 Protect Toolbox and Security Operations Suite (SOS)

The Army C2 Protect Toolbox goal is to identify and make readily available UNIX and DOS based tools that can be easily ported and integrated into Army AIS by individual systems such as AFATDS.

The Security Operations Suite (SOS) provides an easy method to do the administration, report generation, report inspection, and intrusion alerts for four C2 Protect Toolbox tools. To access the SOS tools, log in as secman. The Security Operations Suite (SOS) Main Menu provides access each of the four C2 Protect tools: TCP Wrapper, Change Detection Tool, Swatch, and McAfee. A brief description of the tools is provided in Table I.

Table I. Security Operations Suite (SOS) Tools

Name	Description
TCP Wrapper	TCP Wrapper is a Unix host application that takes the place of regular host TCP daemon. TCP Wrapper is used to authenticate TCP and UDP connections to hosts.
Change Detection Tool (CDT)	The Change Detection Tool provides change detection on files, users, and groups. It can detect changes to file attributes such as permissions, ownership, modification time, and the appearance/disappearance of files.
Simple Watcher (Swatch)	Simple Watcher monitors the system audit files for refused connections identified by TCP Wrappers and issues an alert to the operator.
McAfee Anti Virus for Hard Drives	McAfee Anti Virus automatically monitors the workstation for viruses. It also provides on-demand detection of viruses on the workstation hard drive(s), prevents virus-infected programs from running, detects viruses from various media, and prevents infected programs from being copied.
McAfee Anti Virus for Floppy and OD Drives	While not a part of the SOS, a separate McAfee Anti-Virus provides on-demand detection of viruses on floppy and OD drives.

6.2.4 The COE Security Bar -- Changing Workstation Security Levels

The security banner software provides a graphical display of the current security level of the workstation upon which it is installed. The Security Level Manager segment provides a means for a security manager (secman) to change the displayed security level of the workstation and optionally allow that level to be temporarily overridden.

6.2.5 Unlocking a Locked Out User

To unlock users previously locked out due to too many invalid login attempts you must be logged in as the Security Administrator (secman) and have X-Term privilege. For more detailed information on the COE Security Bar, refer to the AV6.4.0.0 Trusted Facility Manual (TFM), MX-25-455.

6.3 AFATDS System Administrator (SA) Functionality

AFATDS System Administrator is a duty title that a user (can be the IAM) assumes upon logon to the workstation assigned to perform the AFATDS System Administrator assignment. Reserved privileges for the SA are:

- Configuration of the OPFAC
- Assignment of AFATDS Workstations
- Assignment of privileges to user accounts
- Assignment of privileges to client accounts (for example, EMT, FST)
- Management of alerts relating to software and hardware failures
- Management of the AFATDS event log
- Control of specified AFATDS printer functions
- AFATDS application shutdown

Management of the communication configuration defaults to the AFATDS SA but may be assigned to another AFATDS Workstation. Due to the importance of having an administrator, the first workstation within the OPFAC to logon will be automatically assigned AFATDS SA duties. Once the initial AFATDS SA has been determined by default, the unit operating procedures will describe the orderly progression of personnel capable of performing the AFATDS SA functions. The AFATDS SA assignment can migrate to other workstations through the System/Assignment menu selection. The following paragraph describes the assignment options.

6.4 Definition of Roles, Assignments, Duties, and Privileges

For this discussion, these terms are defined as follows:

- Role - A role will be an operational capability of an OPFAC (Fire Support Element vs. Field Artillery CP), supported by software, and loaded when the user selects the role. Roles will not affect the operations of the Trusted Facility software discussed in this manual.
- Assignment - A term for the software running on a workstation, the assignment will initially be made during OPFAC configuration. The AFATDS assignments include AFATDS System Administrator, Communications Administrator, Mission Monitor, and Message Monitor, and they can be moved to other workstations in the OPFAC, as required, to follow the associated movement of personnel/reorganization within the OPFAC. The AFATDS General Operations assignment will be available at every workstation.
- Duties - A duty will be a window navigation path that will allow a user to get to a particular set of data associated with an assignment. (A user who will be performing the duty of System Administrator can only perform that duty at a workstation that will be running/assigned the System Administrator software.)
- Privileges - Privileges and permission will be used interchangeably to identify those duties or navigation paths that will require permission before the navigation path can be implemented.

6.5 User or Operator

The security features available on the AFATDS Workstation provide the commander with a method of controlling access to the system through assignment of User IDs and passwords. They also control access to critical functions through the use of permissions. These security features must be consistently applied throughout the unit to maintain the levels of control and protection provided by AFATDS.

6.5.1 Unauthorized Software

Procedurally, AFATDS users should not introduce any unauthorized software into the OPFAC/IUC nor attempt to load non-AFATDS or non-COE software unless directed by maintenance guidelines.

6.5.2 Communications Security

Normal AFATDS communications are conducted by secure means. Communications Security (COMSEC) is one of those means that includes procedures as well as equipment in providing a degree of secrecy to communications. For example, a COMSEC device bypass is a procedure that logically removes the cryptographic device from the configuration, due to a cryptographic device failure, thereby allowing an authorized communication usually in an emergency situation.

For interoperability with Paladin and Multiple Launch Rocket System (MLRS) units the messages must be exchanged as unclassified even though the system is in the classified mode. Checking the “Send Messages Unclassified” box in the Edit Unit window does this. This should NOT be done for any other unit types.

6.6 AFATDS Assignments and Privileges

Access to AFATDS data is controlled through the use of AFATDS assignments and privileges. AFATDS Assignments are specific functions that can be assigned to an AFATDS Workstation. A function that is to be performed only at one (1) AFATDS Workstation at a time is an assignment. Table II shows the AFATDS assignments and the menu paths that are associated with the assignment and the AFATDS privileges required for some of the menu paths.

An AFATDS privilege restricts access to a critical menu path to the user who has been given that privilege by the AFATDS system administrator. Privileges are tied to an assignment in that the AFATDS application must first have the assignment turned on. Any user attempting to make a selection that has not been granted the privilege for that menu path will be denied access. Privileges are assigned to a user group via the **System/Administration/Client/User - Client/User Administration - User** selection. Users are then assigned to a group via the **System/Administration/Client/User - Client/User Administration - User** selection.

Common AFATDS assignments are available at every workstation, however before a user can develop or implement a plan, he must have the privilege to do so.

Table II. AFATDS Assignments and Privileges

AFATDS Assignment	Operator Privilege	Menu Path Selections
System Administrator	Set Time	System/Administration/Set Times
	Master Unit List Access	System/Administration/Master Unit List
	User Account Access	System/Administration/Client/User
	User Account Access	System/Administration/Client/User - Client/User Administration - User System/Administration/Backup Database System/Administration/Restore Database System/Emergency Purge
	Client Account Access	System/Administration/Client/User - Client/User Administration - Client
Comm Administrator	Communications	System/Configuration/Communications/Current System/Configuration/Communications/Planned C: (Communications) button on Status Line/Communications Alert List
Message Monitor	Messages	Messages/Received Messages Messages/Message Log Messages/Deferred Message Log Messages/Configure Messages Setup
Mission Monitor	Mission Processing	Mission Processing/Mission Monitor Mission Processing/Active Missions/Attack Option Ranking Mission Processing/Active Missions/Intervention Points Mission Processing/Attack Analysis Level
Client (EMT or FST)	View Unit Data Update Unit data View Geometry Data Update Geometry Data View Guidance Data Update Guidance Data View Target Data Update Target Data Perform Mission Commands Perform Collaboration	
Common (all Workstations)	Plan maintenance	Situations/New Plan Situations/Received Plans /Current - Preview Delete (All navigation) New Plan... (All navigation) New Phase... (All navigation)
	Display Event Log	System/System Tools/Event Log - Options/Display Filter
	Implement Plan	Situations/Implement Plan

6.7 AFATDS System Administrator Client/User Administration

The AFATDS System Administrator has the capability to create, enable, define Client/User access (permissions), and view Permissions assignment for any Client/User.

The Maximum Number of allowable Clients is selectable by the AFATDS System Administrator. If the number of Clients is set to a lower value than the number of those connected, clients will not be automatically disconnected, but are lost through attrition. The connected clients are listed and the AFATDS System Administrator has the ability to select and manually disconnect any client.

6.8 SYSTEM Purge

6.8.1 Purging Data

Purging is removal of data from an Automated Information Systems (AIS), its storage devices, or other peripheral devices with storage capacity in such a way that the data may not be reconstructed. In order to make an AFATDS workstation operational after completion of any purge, software will have to be reinstalled and databases restored from an archive.

The purge mechanism is part of the AFATDS Trusted Computing Base. The basic types of purges are the following:

- Volatile (power-dependent) memory - The purging of RAM and volatile cache is accomplished by turning the computer power off, on, and then off again.
- Removable media (optical, Jazz, floppy disks) - Since the optical, Jazz, and floppy drives are not capable of being purged, they must be destroyed.
- Hard disk purge - The purging mechanism of a hard disk consists of an overwrite of all locations of the addressable memory space three times (the first time with a random character, the second time with a specified character, the third time with the complement of that specified character). The absence of data remnants after the purge activity is confirmed by checking for a character other than the specified character. There are two types of hard disk purge available (Emergency Purge and Selectable Disk Purge) depending on the need. Emergency Purge and Selectable Disk Purge are discussed in the following paragraphs.

6.8.2 Emergency Purge (Hard Disk)

The Emergency Purge only purges critical data and should only be used in time sensitive situations, such as imminent capture of the workstation by the enemy. Emergency Purge is an OPFAC-wide purge and requires the operator to verify intent before executing, since this action has such serious potential for data loss. The system provides on-line menus for data erasure for the operator. The Emergency Purge is not to be used to sanitize a hard disk for the purpose of declassification (see Selectable Disk Purge).

6.8.3 Selectable Disk Purge (Hard Disk)

The Selectable Disk Purge is only available on a separate CD and is only an IAM-authorized function. The Selectable Disk Purge procedure meets existing security requirements of AR 380-19 for purging a hard drive for the purpose of declassification. In order to make an AFATDS workstation operational after completion of any purge, software will have to be reinstalled and databases restored from an archive. The IAM must verify successful completion of this process before re-use of the affected media.

6.9 IAM Audit Log Viewer

Security Audit is a means to create a chronological record of system security related activities that can be used to reconstruct, review, and examine a sequence of activities or events. The IAM Audit Log Viewer is a graphical user interface that aids the user (IAM) in viewing the events that are created in various Solaris and Security Audit files.

6.9.1 How to Start the IAM Audit Log Viewer

The IAM Audit Log Viewer is started from “secman” log-on and the COE Desktop. Selecting Start/Programs/Security Functions/System Log Viewer from the menu selections starts the Audit Log Viewer.

6.9.2 IAM Audit Log Viewer Window

An example of the Audit Log Viewer Window is shown in Figure 5. There are two major function capabilities - file functions and search functions. The file functions available are **Open**, **Delete**, and **Archive**. The String Search functions are **Search Forward** and **Search Backward** with case sensitivity selectable.

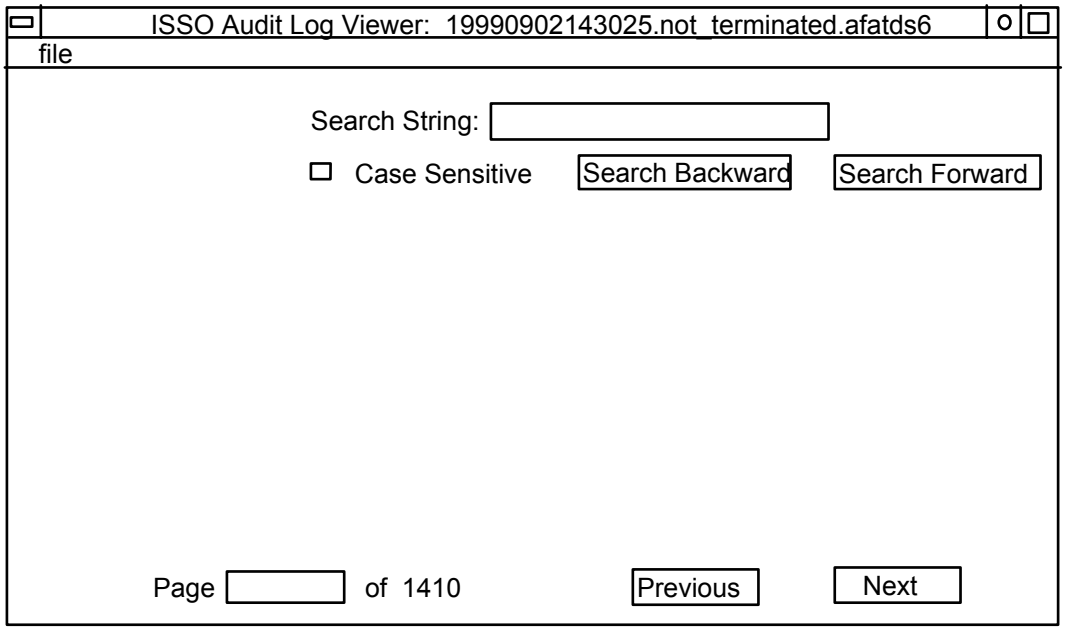

Figure 5. Audit Log Viewer Window

6.9.3 File Submenus

The functions available are activated by clicking on the file submenus (see Figure 6). The "Delete" selection is not available until the "Archive" is performed.

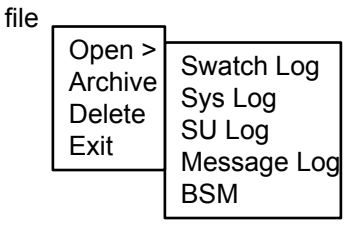

Figure 6. Audit Log Viewer File Submenus

APPENDIX A
ON LINE INFORMATION

A.1 Internet Sites Supporting Training

Online AFATDS Operator course

http://www.adtdl.army.mil/cgi-bin/atdl.dll/cm/techfd/techfd.htm

http://www.adtdl.army.mil/cgi-bin/atdl.dll/cm/afatds/afatds.htm

A.2 Program Manager/TRADOC Systems Manager Information

TRADOC System Manager Homepage http://www.army.mil/tsm_fatds/

A.3 USMC Nett Homepage

http://sill-www.army.mil/usmc/usmc_nett/

(This page intentionally left blank.)

APPENDIX B
FIRES AND EFFECTS CONSIDERATIONS

B.1 Purpose

AFATDS uses guidances as record keeping tools or as data for planning functions and for fire missions to determine how and when to attack targets. This appendix will provide an overview of the guidance categories as a mission is passed from one OPFAC to another at intervention.

B.2 Target Processing

Target Selection Standards: Is the target accurately located, timely? Is the observer reliable in acquiring the reported target type? Was TLE provided? If not calculate TLE or extract from unit's data. Failures are routed to Target Generation functions for combination and refinement.

Mission Precedence and Value: Checks Target guidance - Determines when "immediate" vs. "as acquired" the target should be attacked. Also assign a mission value based on target parameters and current Commander's target guidance.

Target Duplication: Check to see if an active fire mission is currently ongoing at or near ('near" based on target guidance) the requested target.

Target Buildup Criteria: Check to see if a target buildup area for the reported target type has been established, is active and, if so, check to ensure that the required quantity of targets have previously been reported in that TBA).

Target Exclusion: Check target guidance to see if Commander's guidance excludes attack on this type of target.

Target Decay: Check Target Guidance to extract a "decay Time" for this target type (if not provided in the fire request). Assesses whether the target's dwell time has been exceeded.

B.3 Coordination Processing

FSCMs: applies doctrinal checks against coordination measure geometry to determine if coordination is required – consider the hazard distance, command and support relationships, 3D aspects of airspace geometry, munition maximum apogees or computed 3D rocket/missile flight path or computed 3D ballistic trajectory for cannon munitions.

Clearance of Fires (CoF): Has the target type (based on clearance criteria guidance), Munition (e.g., ATACMS) and point of attack (target location) has been identified in the CoF rule set as requiring coordination?

IEW coordination. Is coordination with intelligence community required?

Blue Force Check (V6.x): Could Collateral effects of the mission place Friendlies at risk considering the munition to be used?

Protected Area (V6.x): Any "No Strike" locations (Mosques, Embassies etc.) within Minimum safe distance of target considering the munition to be used?

B.4 Attack Analysis

Determine Candidate Weapons

Determine candidate-firing using:

- UTO relationships in the unit database
- Attack guidance specified in the fire request

Eliminate restricted units (based on guidance)

Eliminate Fire Support Systems reserved for high value missions

Determine Candidate Munitions

Determine the munitions best suited for the target considering:Fire request specifications

- Attack Guidance: Based on target parameters

- Munitions that are most effective in causing damage to the given target type

Determine the munitions that should not be used considering:Restrictive FSCMs

- Attack Guidance (consider TLE, Target size and Strength, distance from friendly troops etc…)
- Fire unit restrictions

Determine the volume of fire to attack the target.

Quantity specified in the fire request

Effects analysis “Super Quickie II” or the “SMART” algorithm

B.5 Analyze Fire Units

Assess each fire unit’s capability to attack and defeat the target considering: Unit’s Range fan and munition ranges

- Unit’s current operational status
- Unit’s “Dead Space Area(s)”
- Unit’s restrictions
- Unit’s available weapons and on-hand, munitions
- Fire unit response time - can it engage the target by the decay time (or NLT or TOT)?
- Active missions already at the fire unit, considers the mission’s precedence and value to determine if the fire unit could respond in time.
- Gun-Target - trajectory and Airspace control areas
- Determine Weapon Platform technical Solution

FA Cannons: Calculate the ballistic solution (including trajectory) to be used to engage the target.

The trajectory is used in clearing 3D air space and check for intervening terrain (“Down-range masks”) between the fire unit and target location.

MLRS Launchers: calculate the rocket or missile flight path (including expected altitudes throughout the flight path) to be used to engage the target.

The flight path is used in clearing 3D air space and check for intervening terrain (“Down-range masks”) between the fire unit and target location. Select/Recommend Attack Options.

Several options will be generated. Select the option based the following considerations (the importance of these considerations can be changed by the operator):

- Requested fire units and munitions
- Guidance specified fire units and munitions
- Fire unit closest to target
- Shortest range munitions (e.g., don’t use Enhanced Range munitions when it’s not necessary)
- Fire that is “least busy”
- Fire unit with shortest response time
- Units that are in “Direct Support” of my Unit
- Options that use the default munitions
- Operator Review (This is an optional step), based on “intervention rules” telling AFATDS what types of missions the operator wants to see. For example, in an environment with a high rate of missions, the operator may elect to see only those missions that were recommended for denial or that use specific munitions (e.g., ATACMS - BAT). If no operator review is required, the option is automatically executed. If operator review is required, AFATDS will present the operator with all options that were considered.

While reviewing the mission, the Operator can:

- Override the AFATDS solution
- Select different options

- Create his own option
- Deny the mission
- Send the mission to another unit for further analysis
- Schedule Mission

When tasking weapon systems directly - Determine when and where to transmit the mission: Consider weapon platform capabilities: Multiple missions allowed?

Wait until NET or TOT time nears (Don't send to weapon until necessary.)

Manage mission-scheduling queue for each weapon

Transmit Mission

Create Fire order with appropriate information: Format data as required by weapon platform.

Monitor to determine if weapon received mission successfully and will comply

Manage – Monitor – Complete Mission

Direct all subsequent messaging and monitoring of status related to the mission. This includes:

- Send Fire Orders to selected units
- Automatic generation and distribution of Minefield data for Artillery delivered mines
- Automatic transmission of coordination requests. Update the target's "No Earlier Than" (NET) and "No Later Than" (NLT) times if specified in the response.
- Automatic Generation and transmission of the Message to observer
- Automatic forwarding of weapon system actions (e.g., "Shots fired", etc.) to the requestor
- Automatic processing of subsequent adjustments (changes to aimpoint)
- Automatic processing of End of mission (EOM) messages
- Automatic generation and distribution of a Mission Fired Report
- Automatic checking of actual effects achieved (as reported by the requestor) against the Damage Assessment requirements for this target

(This page intentionally left blank.)

APPENDIX C
COMPUTER CONFIGURATIONS

Hardware		CCU2	UCU2	UNIX Laptop	NCU
CPU Speed		333 MHz or 440 MHz	300 MHz	500 MHz	Pentium IV 1.6GHz
Internal Bus Type		PCI	SBus	PCI	
RAM Amount		1 GB	1 GB or greater	2 GB	256MB SDRAM
SCSI	**Type**	Ultra Wide SCSI 3	Ultra Wide SCSI 3	None	
		Dual Port	Fast Wide SCSI 2		
RHDD	**Size/Type**	36 GB Ultra Wide	18 GB Ultra Wide	40 GB Laptop IDE	30GB
	Holders	2	2	2 (different slots)	1
CDROM Speed		32X or greater	32x	None	None
DVD / CD-RW	**Speed**	None	None	8x DVD ROM, 24x Read / 8x Write CD (removable)	4X DVD-ROM
Optical Disk Capacity		None	Up to 2.6 GB	None	None
JAZ Capacity		2.0 GB (Note 4)	None	None	None
Flash Memory Card Capacity		64 MB or greater (Note 4)	64 MB or greater	None	None
Flash Key (USB) Capacity		None	None	64 MB or greater	None
OS and Patches	**AV7: Solaris 2.8 02/02**	SOLPTH 4.7.0.0 (Note 2) AFASPP 2.1.0.0 (Note 6)	SOLPTH 4.7.0.0 (Note 2) AFASPP 2.1.0.0 (Note 6)	SOLPTH 4.7.0.0 (Note 2) AFASPP 2.1.0.0 (Note 6)	Windows 2000
Openboot Version (minimum)		3.11.2 or greater	3.11.2 or greater	4.03 or greater	N/A
TCIMs External SCSI		2	2	0	0
SP-TCIMs Installed in PCMCIA (Type II) Slots		2 (Note 3)	0 (Note 1)	2 (Note 3)	(Note 5)
TACLINK	**2000 (LAN Interface)**	2	2	2	0
	3000 (PCMCIA Interface)	2 (Note 3)	0	2 (Note 3)	0
Ethernet	**Native LAN**	100/10 Base T	100/10 MII RJ45	100/10 Base T	100/10 Base T
	LAN Board	100/10 Base T	100/10 MII RJ45	100/10 Base T	100/10 Base T
USB Connectors Number		0	0	3	2
Printer Port Number		1	1	1	1

Note 1: AFATDS can support a non-standard configuration with one SP-TCIM in an internal slot.

Note 2: Operating System and Patch Level (COE Segment) as of 01 January 2003

Note 3: The combined number of TACLINK 3000 devices and SP-TCIMs cannot be more than two.

Note 4: JAZ drive or Flash Memory Card, not both at the same time. The JAZ drive and Flash Memory Card occupy the same bay.

Note 5: For EMT in FST mode SP-TCIMs must be used in the available PCMCIA slots.
Note 6: OS for Tadpole also contains patches specific for Tadpole.

APPENDIX D
SUPPORTED COMMUNICATIONS SETTINGS

Protocol	Media	Data Encoding	Data Rates (bps)
TACFIRE	SINCGARS ICOM	FSK 1200/2400	600, 1200
		FSK 1300/2100	600, 1200
		NRZ	600, 1200, 2400, 4800, 16K
	Local Radio	FSK 1200/2400	600, 1200
		FSK 1300/2100	600, 1200
	KY-57	FSK 1200/2400	600, 1200
		FSK 1300/2100	600, 1200
		NRZ	600, 1200, 2400, 4800, 16K
	2 Wire	FSK 1200/2400	600, 1200
		FSK 1300/2100	600, 1200
		CDP	8K, 16K, 32K
	2 Wire Switched	FSK 1200/2400	600, 1200
		FSK 1300/2100	600, 1200
	4 Wire	FSK 1200/2400	600, 1200
		FSK 1300/2100	600, 1200
	4 Wire Switched	FSK 1200/2400	600, 1200
		FSK 1300/2100	600, 1200
	GRA-39A	FSK 1200/2400	600, 1200
		FSK 1300/2100	600, 1200
	GRA-6	FSK 1200/2400	600, 1200
		FSK 1300/2100	600, 1200
	DNVT-1035	NRZ	600, 1200
	DNVT-1042	NRZ	600, 1200
	DSVT-MSRT	NRZ	600, 1200
VMF	SINCGARS ICOM	NRZ	600,1200,2400,4800, 16K
		FSK 1200/2400	600, 1200
		FSK 1300/1700	600
		FSK 1300/2100	600, 1200
		FSK 1575/2425	600, 1200
	Local Radio	FSK 1200/2400	600, 1200
		FSK 1300/1700	600
		FSK 1300/2100	600, 1200
		FSK 1575/2425	600, 1200

Protocol	Media	Data Encoding	Data Rates (bps)
	KY-57	NRZ	16K
		FSK 1200/2400	600, 1200
		FSK 1300/1700	600
		FSK 1300/2100	600, 1200
		FSK 1575/2425	600, 1200
	KG-84A	NRZ	600, 1200
	2 Wire	CDP	8K, 16K, 32K
		FSK 1200/2400	600, 1200
		FSK 1300/1700	600
		FSK 1300/2100	600, 1200
		FSK 1575/2425	600, 1200
	2 Wire Switched	FSK 1200/2400	600, 1200
		FSK 1300/1700	600
		FSK 1300/2100	600, 1200
		FSK 1575/2425	600, 1200
	4 Wire	CDP	8K, 16K, 32K
		FSK 1200/2400	600, 1200
		FSK 1300/1700	600
		FSK 1300/2100	600, 1200
		FSK 1575/2425	600, 1200
	4 Wire Switched	FSK 1200/2400	600, 1200
		FSK 1300/1700	600
		FSK 1300/2100	600, 1200
		FSK 1575/2425	600, 1200
	GRA-39A	FSK 1200/2400	600, 1200
		FSK 1300/1700	600
		FSK 1300/2100	600, 1200
		FSK 1575/2425	600, 1200
	GRA-6	FSK 1200/2400	600, 1200
		FSK 1300/1700	600
		FSK 1300/2100	600, 1200
		FSK 1575/2425	600, 1200
	DNVT-1035	NRZ	600, 1200, 16K
	DNVT-1042	NRZ	600, 1200, 16K
	DSVT-MSRT	NRZ	16K
NATO	SINCGARS ICOM	FSK 1575/2425	600,1200
	Local Radio	FSK 1575/2425	600,1200

Protocol	Media	Data Encoding	Data Rates (bps)
	KY-57	FSK 1575/2425	600,1200
	2 Wire	FSK 1575/2425	600,1200
	2 Wire Switched	FSK 1575/2425	600,1200
	GRA-39A	FSK 1575/2425	600,1200
	GRA-6	FSK 1575/2425	600,1200
EPLRS	EPUU	NRZ	600, 1200, 2400, 4800, 8K, 9600, 16K, 19200, 24K, 32K
		CDP	600, 1200, 2400, 4800, 8K, 9600, 16K, 19200, 24K, 32K
LAN	N/A	N/A	N/A (Approx. 10 Million)
MPN LAN	N/A	N/A	N/A
MCS	SINCGARS ICOM	NRZ	600, 1200, 2400, 4800, 16K
		FSK 1200/2400	600, 1200
		FSK 1300/1700	600
		FSK 1300/2100	1200
	Local Radio	FSK 1200/2400	600, 1200
		FSK 1300/1700	600
		FSK 1300/2100	1200
	KY-57	NRZ	16K
		FSK 1200/2400	600, 1200
		FSK 1300/1700	600, 1200
		FSK 1300/2100	600, 1200
	KG-84A	NRZ	16K, 32K
	2-Wire	CDP	8K, 16K, 32K
		FSK 1200/2400	600, 1200
		FSK 1300/1700	600, 1200
		FSK 1300/2100	600, 1200
	2-Wire Switched	FSK 1200/2400	600, 1200
		FSK 1300/1700	600, 1200
		FSK 1300/2100	600, 1200
	4 Wire	CDP	8K, 16K 32K
		FSK 1200/2400	600, 1200
		FSK 1300/1700	600, 1200
		FSK 1300/2100	600, 1200

Protocol	Media	Data Encoding	Data Rates (bps)
	4 Wire Switched	FSK 1200/2400	600, 1200
		FSK 1300/1700	600, 1200
		FSK 1300/2100	600, 1200
	GRA-39A	FSK 1200/2400	600, 1200
		FSK 1300/1700	600
		FSK 1300/2100	1200
	GRA-6	FSK 1200/2400	600, 1200
		FSK 1300/1700	600
		FSK 1300/2100	1200
	DNVT-1035	NRZ	16K, 32K
	DNVT-1042	NRZ	16K, 32K
	DSVT-MSRT	NRZ	16K, 32K
188-220A	SINCGARS	NRZ	600,1200,2400,4800, 16K, 1200N, 2400N, 4800N, 9600N
		FSK 188C/4202A	75,150,300,600,1200
	2 Wire	CDP	16K, 32K
		FSK 188C/4202A	75,150,300,600,1200
	4 Wire	CDP	16K, 32K
		FSK 188C/4202A	75,150,300,600,1200
	Analog	FSK 188C/4202A	75,150,300,600,1200
	KY 57	FSK 188C/4202A	75,150,300,600,1200
		NRZ	16K
GDU	Local radio	N/A	N/A
	2 Wire	N/A	N/A
	2 Wire and radio	N/A	N/A
FCS	SINCGARS ICOM	NRZ	600, 1200, 2400, 4800, 16K
		FSK 1200/2400	600, 1200
		FSK 1300/2100	600, 1200
	Local Radio	FSK 1200/2400	600, 1200
		FSK 1300/2100	600, 1200
	KY-57	NRZ	600, 1200, 2400, 4800, 16K
		FSK 1200/2400	600, 1200
		FSK 1300/2100	600, 1200
	2 Wire	CDP	8K, 16K 32K
		FSK 1200/2400	600, 1200
		FSK 1300/2100	600, 1200

Protocol	Media	Data Encoding	Data Rates (bps)
	2 Wire Switched	FSK 1200/2400	600, 1200
		FSK 1300/2100	600, 1200
	4 Wire	FSK 1200/2400	600, 1200
		FSK 1300/2100	600, 1200
	4 Wire Switched	FSK 1200/2400	600, 1200
		FSK 1300/2100	600, 1200
	GRA-39A	FSK 1200/2400	600, 1200
		FSK 1300/2100	600, 1200
	GRA-6	FSK 1200/2400	600, 1200
		FSK 1300/2100	600, 1200
	DNVT-1035	NRZ	600, 1200
	DNVT-1042	NRZ	600, 1200
	DNVT-MSRT	NRZ	600, 1200

(This page intentionally left blank.)

APPENDIX E
IMPORTING AND EXPORTING THE MASTER UNIT LIST

Procedure: Import or Export Master Unit List (MUL) to or from Removable data		
Step	**Action**	**Results/Explanation**
1.	Select System\Administration\Master Unit List.	Master Unit List window opens.
	NOTE Selecting OK at any time closes the Master Unit List window. To perform the following Master Unit List window functions, go to the steps below. Export List (Step 2) Import List (Step 7) Create a new unit (Step 13) Edit a unit (Step 14) Delete a unit (Step 29)	
2.	Select Options\Import\Export.	Import Export Master Unit List window opens
3.	Select Archive Device with Status of Ready to receive file.	
	NOTE To remove disk after export function is complete, access Import Export Master Unit List window, select Archive Device from which to release disk, and select the Eject button to release and eject the selected disk. To refresh Archive Device list select Refresh button.	
4.	Select Export.	Confirm Master Unit List Export window opens.
5.	Select Export.	Confirm Master Unit List Export window closes. Import Export Master Unit List window becomes active.
6.	To perform other functions of Master Unit List window, refer to note prior to step 2.	
7.	Select Options\Import\Export.	Import Export Master Unit List window opens.
	NOTE To remove disk after import function is complete, access Import Master Unit List window, select Archive Device from which to release disk, and select the Eject button to release and eject the selected disk. To refresh Archive Device list and clear Files list select Refresh button. To delete an archive file from optical disk select Archive Device with Status of Ready, select and highlight file from Files list and select Delete button.	
8.	Select Archive Device with status of Ready containing master unit list file to import.	Files list fills with any existing archive file names.
9.	Select file Master Unit List from Files list.	

Procedure: Import or Export Master Unit List (MUL) to or from Removable data		
Step	**Action**	**Results/Explanation**
10.	Select Import\Export....	Confirm Import window opens. This window lists any discrepancies note between the current lists and the list to be imported.
11.	Select Import.	Confirm Import window closes.
12.	To perform other functions of Master Unit List window, refer to note prior to step 2.	
13.	Select New (proceed to step 16).	Edit Unit window opens.
14.	Select AFATDS Unit ID:	
15.	Select Edit.	Edit Unit window opens,
16.	Enter System Name:	
17.	Enter AFATDS Unit Number:	
18.	Enter Unit Reference Number:	
19.	Select System Type:	Select System Type window opens.
20.	Select system type.	
21.	Select OK.	Select System Type window closes. Selection appears in System Type: field.
22.	Enter Default MSE Phone Number (1-22 numeric characters).	
23.	Enter Default EPLRS LCN: (0-255).	
24.	Enter EPLRS MILID: (1-8 alphanumeric characters).	
NOTE **Legal entries for TACFIRE Alias: fields are:** Section Number..... 1 alphanumeric character Platoon Number..... 1 alphanumeric character Battery ..... 1 alphanumeric character Battalion or Observer number ..... 2 alphanumeric characters Regiment/Brigade/Division ..... 3 alpha numeric characters		
25.	Enter TACFIRE Alias or VMF Unit ID: (required for AFATDS and TACFIRE systems, 1-8 alphanumeric characters).	
NOTE Legal entries for NATO Alias: fields are: Section Number 1 alphanumeric character Platoon Number 1 alphanumeric character Battery 1 alphanumeric character Battalion or Observer number 3 alphanumeric characters Regiment/Brigade/Division 3 alphanumeric characters		
26.	Enter NATO Alias: (1-9 alphanumeric characters.	

Procedure: Import or Export Master Unit List (MUL) to or from Removable data		
Step	**Action**	**Results/Explanation**
	NOTE The fields for the ACCS Alias do not necessarily relate to an echelon. The user will normally enter echelons, but as long as the entries match entries at other OPFACs and are within legal limits, no other restrictions apply. Legal entries for ACCS Alias: fields are: 1st 1-4 alphanumeric characters 2nd 1-9 alphanumeric characters 3rd 1-2 alphanumeric characters 4th 1-5 alphanumeric characters 5th 1-5 alphanumeric characters 6th 1-5 alphanumeric characters 7th 1-3 alphanumeric characters	
27.	Enter ACCS Alias: (1-33 alphanumeric characters).	
28.	Select OK.	Edit Unit window closes.
29.	To perform other functions of Master Unit List window, refer to note prior to step 2.	
30.	Select unit to be deleted.	
31.	Select Delete....	Confirm Unit Delete window opens.
32.	Select Delete.	Confirm Delete Unit window closes.
33.	To perform other functions of Master Unit List window, refer to note prior to step 2.	

(This page intentionally left blank.)

APPENDIX F
JMTK WINDOW EXPLAINED

This overview orients the leader to key windows used in AFATDS operations. Leaders familiar with these windows will be able to better interface with the operator when looking for information or providing guidance. More detailed explanations can be found in the Technical Manual.

This window will be explained section by section as noted with the arrows in Figure 7 below.

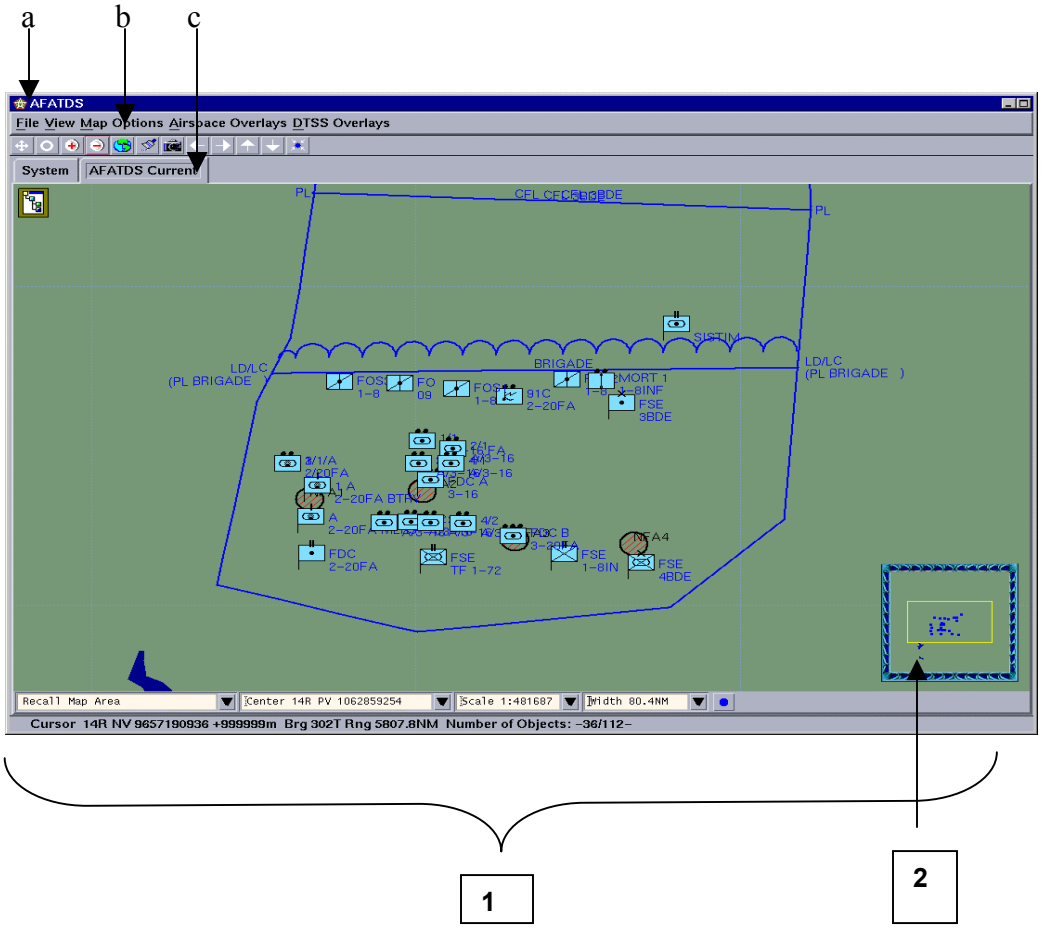

Figure 7. The JMTK Window

The AFATDS JMTK map has three major menus. File, View, Map Options

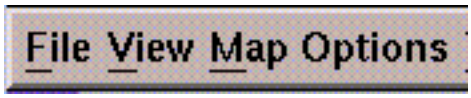

Figure 8. Menu Options on the JMTK Map (Arrow a)

The **File** menu has the following sub-menus:

- **Save Session** allows the operator to save the map session that is currently displayed. This option will save the entire map that is displayed.
- **Save Map** Area is used to save a specific area with a name associated to it. The operator can select this function and when the window is displayed he will provide a name for the specific area of the map and select OK to save that area.
- **Recall Map** Area allows the operator to display any map area that has been previously saved to his workstation.

- **View Saved Snapshots** will display any map snapshots that were created by selecting the camera icon on the map menu bar.
- **Delete Saved Windows** is not currently used.
- **Delete Saved Map Areas** displays the map areas that were previously saved by the operator.
- **Delete Saved Snapshots** may be used to delete any map snapshots that were created

The **View** menu selection has four sub-menus. Coordinates, Status Bar Toggles, Reload Default Menus, and Toggle Raise.

- **Coordinates** sub-menu allows the operator to define the coordinate system he wishes to use with the map. The operator changes the coordinate system to be used with the map by selecting View / Coordinates. The drop down list will appear and the operator will select the coordinate system and the map will switch to that coordinate system. Coordinates will be displayed in the information bar. The information bar will be explained later in this section.
- **Status Bar Toggles** allows the operator to turn on / off several different features. Most of these will not used in normal operations. If you toggle the menus off, you will not be able to toggle them back on without shutting down and re-starting AFATDS.

Map Options menu controls many of the map properties and controls in the JMTK Current Situation map.

- **Zoom** allows the operator to enlarge (zoom in) on selected areas of the map. When the Zoom option is selected a cursor with four arrowheads will appear. Use the trackball to move this cursor to the upper left corner of the area you want to enlarge. While holding down the left trackball button move the trackball downward to the right. This will enlarge the zoom window. When you have reached the desired size release the left trackball button.
- **Map Properties** displays the settings for the current map.
- **Recenter** will recenter the map to the current location of the Center Marker.
- **Center Marker** will display a center marker that the operator can move.
- **Center on Marker** has the same effect as the recenter command.
- **Map Types** displays a list of the map types that can be displayed if they are stored for recall on the hard drive. The map types available are: Solid Background Map, WVS Vector Map, WVS Plus Vector Map, RPF Map by Tiles, and RPF Map by Series.
- **Scale** Controls allow the operator to change map scale. The scales available are, 4 x Scale In, 3 x Scale In, 2 x Scale In, ½ Scale Out, 1/3 Scale Out, ¼ Scale Out, and Whole World.
- **Grid Controls** allow the operator to change grid line labels, lines, etc. The controls available are, Map Grids, Grid Lines On, Grid Off, Grid Labels On, and Grid Labels Off.
- **Toggle Country Labels** turns country name labels on and off. This feature only works if the map files loaded have been stored with country names.
- **Map Color** Control is used to adjust map colors. This control will display a menu that allows the operator to change the colors that will be displayed for general map features.
- **Map Intensity** is used to adjust the display intensity of the map.
- **Map Colors** is similar to the Map Color Control menu.
- **Map Palettes and Map Layers** feature is not used with RPF type maps.
- **Map Features** menu allows the operator to access display options for stored map files. The operator can turn on / off stored map files and features. The sub-menus available are, Map Features, Raster Maps, RPF Maps, VPF Features, Terrain Shading, Bottom Contours, and Terrain Contours.
- The **Load CD** function is used to install JMTK map products.
- The **Load Products** function is used to load CD map products by specific type. The menu will allow the operator to load specific map types. The available options are, Load RPF, Load DTED, Load ADRG, and Load VPF.

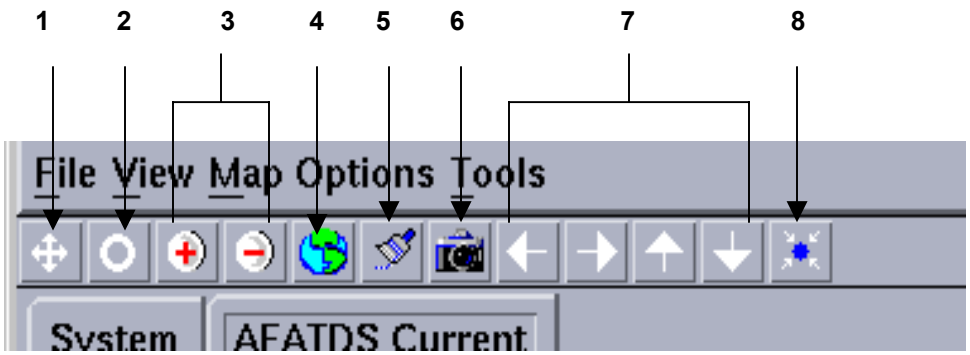

Figure 9. Interface Icons (Arrow b)

Arrow b in Figure 7 is enlarged in Figure 9. These icons are numbered in the figure and track to the numbered explanations below. The icons allow the user to interface with the Joint Mapping Tool Kit for simple tasks. The icons listed from left to right are:

1. **Drag Zoom Arrow;** Allows the user to define the map area that he wants to view, once the user clicks on the arrow the user centers the cursor on the arrow that he wishes to see and defines its by click and hold drag to define area and release. Once released the map will display the area defined. This function has a hotkey of F1, which will turn the cursor into the Drag Zoom icon.

2. **Recenter Icon;** when selected the cursor icon will change to the icon selected, when the operator selects an area on the map display the map will center on that location at the current scale. F4 is the hotkey for this function.

3. **Zoom:** Increases map in view by a factor of 2:1. Hotkey F3. Decreases map in view by a factor of 2:1. Hotkey F2

4. **Whole World Icon**: when selected takes the user to the worldview.

5. **Refresh Map Icon;** Refreshes the map when selected.

6. **Save Screen Image;** When selected the Select or enter Screen Snapshot Name window populates. The user places the cursor in the Selection portion of the window and names the saved screen then selects OK. The area is then saved and can be viewed or deleted from the File drop down menu under View saved Snapshots or Delete Saved snapshots.

7. **Pan Icons;** When selected the map will move in the direction indicated by the arrow. The map will only move to the defined outer boundary as shown in the Map inset (see *Arrow2 figure* 1below).

If the map is zoomed in to an area smaller than whole world, you can use the arrow buttons in the toolbar to scroll the map further in a north, south, east, or west direction. The map will scroll about half the distance of the current view and then stop scrolling. Click on the map, then press F5 to recenter the map at the current pan view. This allows you to continue scrolling in the same direction you were scrolling.

8. **Center Chart Marker Icon:** When selected the map display will center on the chart marker. The Chart marker can be centered where desired by selecting the Recenter Icon, placing it on the desired center location and then selecting the Center Chart Marker Icon.

Section C from Figure 7 is enlarged in Figure 10 and shows where the operator may determine from what map tab he will work. System is the default tab for the JMTK when it initializes. Current Tab is generated when the AFATDS program is started. All AFATDS operations will display on the Current tab.

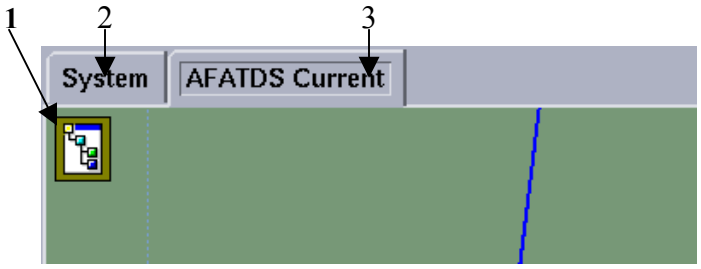

Figure 10. Choice for Map Operations

System Tab: Default tab (2) once JMTK is started before AFATDS is initialized.

Current Tab: Tab is default display for AFATDS information.

NOTE

Users often select the System Tab then become confused when the AFATDS tool menus are no longer displayed.

Menu interface icon: if the user selects View > Status Bar toggles > Toggle Full Screen mode the map will only display the map inset and the Chart Tabs. All other features are hidden. To access those features, place the cursor over the icon (item 1 in Figure 10) and right (3 button) click it. This will display the whole list of features, including those, which were hidden as shown in Figure 11.

Figure 11. Menu Interface Icon menu

At the bottom of the JMTK Map window (Figure 7 arrow 2) is the Status Bar and Message Area which have been enlarged for

Figure 12. Explanations for the various parts follow below. Items 1 through 5 explain the Status Bar and items 6 through 8 explain the message area.

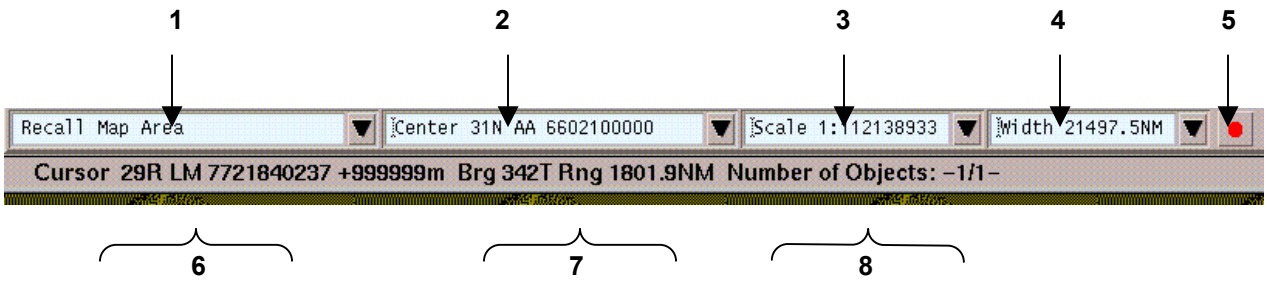

Figure 12. Status Bar and Message Area

The **Status Bar** provides specific controls and information concerning the map currently n view on the screen.

Drop down menu that is accessed by selecting the down arrow to the right of the information field. This menu will contain the default value of Recall Map Area. When the operator saves a Map Area (see arrow a, Figure 7) the “saved as” name appears in this window. Selecting the saved name area displays the map.

Coordinate display drop down menu. Selecting the down arrow to the right of the information field accesses the available coordinate displays. The field informs the user where the current map center is located.

Scale drop down selection menu. Drop down menu that is accessed by selecting the down arrow to the right of the information field. The field will display default scale selection values. This allows the user to select specific scales vice zooming in and out.

Width Drop down menu. Drop down menu that is accessed by selecting the down arrow to the right of the information field. The field allows the user to select varying widths and to display the widths in Miles/Feet, NM (Nautical Miles) only, NM/Yards or KM (Kilometers)/meters.

Toggle Center Marker On/Off.

Message Area

Cursor Location. provides

Bearing from center marker data

Number of Objects displayed on Map

The Quick Pan Box located in the bottom right part of the map area (see Figure 7, arrow 1) has been enlarged for Figure 13 and shows a larger picture of the map with the current view shown in a yellow box.

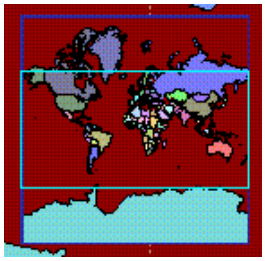

Figure 13. Quick Pan Box

This allows you to see beyond the current map view on the screen and orients you to a bigger picture. To change the current map view to a different area within the Quick Pan Box, click anywhere within the Quick Pan Box to recenter the yellow box around the clicked point. You may also drag the yellow box to a different area within the Quick Pan Box to change the map view to that area. The best way to clarify this feature is to try it out several times.

(This page intentionally left blank.)

APPENDIX G
PROCEDURES FOR LOADING JMTK MAPS

G.1 Procedure for loading ADRG Maps in JMTK

Conditions: AFATDS has been initialized and is ready for operations. The Joint Mapping Tool Kit is used to graphically display the fires situation.

Table III. Procedure for ADRG Maps

Procedure. Load, Display and Manage ADRG Maps in JMTK		
Step	**Action**	**Result/Explanation**
1.	Place ADRG map data disk into CDROM drive.	File manager window populates desktop1.
	NOTE The File Manager window will appear in the upper left of desktop1 and its menu bar will be under the AFATDS security/information bar. To move the file manager select the file manger icon on the bottom bar of the AFATDS, right (3 button) scroll to move and left click (1button). This will allow the user to move the window from under the Security bar.	
a.	Minimize the file manger window	
2.	From the JMTK window select Map Options > Load CD	The Select ADRG Destination File Name window populates.
	NOTE The Select ADRG Destination File Name window populates with the file name on the CD by default.	
a.	From the Select ADRG Destination File Name window select OK.	ADRG Loader Progress window populates and begins to load file selected. When load is complete the window displays the following information window “ADRG Image “filename” Loaded”
b.	From the ADRG Loader Progress window select OK.	The ADRG Loader Progress window closes.
3.	From the JMTK window select Map Options > Map Properties.	AFATDS Current: Map Properties window displays.
a.	From the AFATDS Current: Map Properties window select the dropdown arrow to the right of the Overlay Map 1 entry.	Dropdown menu displays the following; None PX Images RPF Selected Images
b.	From the Overlay Map 1 dropdown menu select > PX Images	Dropdown menu closes; Overlay Map 1 displays PX Images.
c.	From the AFATDS Current: Map Properties window select OK.	The AFATDS Current: Map Properties window closes.
d.	Warning window displays, select OK on window.	Warning window closes.
4.	From the JMTK window select Map Options > Map Features > Raster Maps.	Raster Map controls window displays.

Procedure. Load, Display and Manage ADRG Maps in JMTK		
Step	**Action**	**Result/Explanation**
a.	From the Raster Map controls window select all ADRG maps to be displayed. All maps can be selected by from the window file menu selecting Edit > Select All Individual Maps can be selected from the list by holding down the Ctrl button and clicking on each map to be displayed.	
	NOTE All of the file names that were on the ADRG CD will list in the Raster Map control window. To determine what area the map covers the user looks in the Location field. The grid displayed is the location to the upper left corner of the ADRG map.	
b.	From the Raster Map controls window select the On button.	The Raster Map controls window TGL window column changes from OFF to ON.
c.	From the Raster Map controls window select the Apply button.	ADRG map/maps selected display.
	NOTE To determine if the user wants the map to be displayed the user can select each map individually from the Raster Map Control window. Then from the top menu select Map Options > Center on Map. This will Center the selected Map on the AFATDS Current Tab of the JMTK. The user can then either turn the map off in the Raster Map controls window or if it is an area that he will operate in from the JMTK window select File > Save Map Area. The AFATDS current: Save As window displays in this window (user input name) > OK. The area will then save as a Recall selection on the Status Bar. (See arrow1, figure 1 under JMTK window overview section above)	
5.	To delete maps loaded from the Raster Map controls window highlight the maps not needed then select Edit > Delete Selected Map	Selected maps are deleted from the Raster Map control window as a selection.
	NOTE The number of maps selected for display should be as minimal as possible. Each time the user moves the Current Tab in the JMTK program the maps are redrawn. Its progress is displayed in the message area of the JMTK window. If the user selects all maps to be displayed and is not selective in their display this can result in the system responsiveness being significantly impacted, remember AFATDS is a 440Mhz processor.	
6.	On the Bottom toolbar of the COE screen select the File Manager window that opened in step 1.	File manager window displays.
a.	From the File Manager window select File > Eject.	CDROM ejects and File Manager window closes.

Procedure. Load, Display and Manage ADRG Maps in JMTK		
Step	**Action**	**Result/Explanation**
	NOTE If the file manager window remains open the CDROM will not work until it is closed the Operating system believes the CDROM device to still be in use as long as it is open. Insure users eject the CD to close the file manager window and recover the map CD.	

G.2 Procedure for Loading CIB Maps in JMTK

Conditions: AFATDS has been initialized and is ready for operations. The Joint Mapping Tool Kit is used to graphically display the fires situation; CIB map is available for load.

Table IV. CIB Maps In JMTK

Procedure. Load, Display and Manage CIB Maps in JMTK		
Step	**Action**	**Result/Explanation**
1.	Place CIB map data disk into CDROM drive.	File manager window populates desktop1.
	NOTE The File Manager window will appear in the upper left of desktop1 and its menu bar will be under the AFATDS security/information bar. To move the file manager select the file manger icon on the bottom bar of the AFATDS, right (3 button) scroll to move and left click (1button). This will allow the user to move the window from under the Security bar.	
a.	Minimize the file manger window	
2.	From the JMTK window select Map Options > Load CD	The RPF loader window populates.
a.	From the RPF Loader window input the name of the CIB map to be loaded and select OK. (i.e., Fort Irwin CIB)	RPF Loader message populates “Copy RPF Database “filename” to disk?
b.	Select Yes on the RPF Loader window	RPF Loader Progress window populates and begins to load file selected. When load is complete the window displays the following information window “RPF Image “filename” Loaded”
c.	From the RPF Loader Progress window select OK.	The RPF Loader Progress window closes.
3.	From the JMTK window select Map Options > Map Properties.	AFATDS Current: Map Properties window displays.
a.	From the AFATDS Current: Map Properties window select the dropdown arrow to the right of the Overlay Map 1 entry.	Dropdown menu displays the following; None PX Images RPF Selected Images
b.	From the Overlay Map 1 dropdown menu select > RPF Selected Images	Dropdown menu closes; Overlay Map 1 displays RPF Selected Images.
c.	From the AFATDS Current: Map Properties window select OK.	The AFATDS Current: Map Properties window closes.
d.	Warning window displays, select OK on window.	Warning window closes.

Procedure. Load, Display and Manage CIB Maps in JMTK		
Step	**Action**	**Result/Explanation**
	NOTE Warning window may not display if maps of the RPF select image are already loaded on the system	
4.	From the JMTK window select Map Options > Map Features > RPF Maps.	RPF Editor window displays.
a.	From the RPF Editor window select all CIB maps to be displayed. All maps can be selected by from the window file menu selecting Edit > Turn All On Individual Maps can be selected from the list by holding down the Ctrl button and clicking on each map to be displayed then selecting the On button at the bottom left of the RPF Editor window. Select and Turn on maps by type is also available in the RPF Editor window. For example if RPF maps of Joint Operational Graphics (JOG) were already loaded but the user only wanted to turn on the CIB maps from the RPF Editor window he would select Edit > Select map by type > CIB (5meters)	
	NOTE All of the file names that were on the CIB CD will list in the RPF Editor window. To determine what area the map covers the user looks in the NW Corner field. The grid displayed is the location to the upper left corner of the CIB map.	
b.	From the RPF Editor window select the On button.	The RPF Editor window TGL window column changes from OFF to ON.
c.	From the RPF Editor window select the Apply button.	CIB map/maps selected display.
	NOTE To determine if the user wants the map to be displayed the user can select each map individually from the RPF Editor window. Then from the top menu select Map Options > Center on Map. This will Center the selected Map on the AFATDS Current Tab of the JMTK. The user can then either turn the map off in the RPF Editor window or if it is an area that he will operate in from the JMTK window select File > Save Map Area. The AFATDS current: Save As window displays in this window (user input name) > OK. The area will then save as a Recall selection on the Status Bar. (See arrow1, figure 1 under JMTK window overview section above)	
5.	To delete maps loaded from the RPF Editor window highlight the maps not needed then select File > Delete.	Selected maps are deleted from the RPF Editor window as a selection.

Procedure. Load, Display and Manage CIB Maps in JMTK		
Step	**Action**	**Result/Explanation**
	NOTE The number of maps selected for display should be as minimal as possible. Each time the user moves the Current Tab in the JMTK program the maps are redrawn. Its progress is displayed in the message area of the JMTK window. If the user selects all maps to be displayed and is not selective in their display this can result in the system responsiveness being significantly impacted, remember AFATDS is a 440Mhz processor.	
6.	On the Bottom toolbar of the COE screen select the File Manager window that opened in step 1.	File manager window displays.
a.	From the File Manager window select File > Eject	CDROM ejects and File Manager window closes.
	NOTE If the file manager window remains open the CDROM will not work until it is closed the Operating system believes the CDROM device to still be in use as long as it is open. Insure users eject the CD to close the file manager window and recover the map CD.	

(This page intentionally left blank.)

APPENDIX H
TARGETING

AFATDS targeting information is accessed through the targeting folder icon on the AFATDS Current toolbar. The Target List window allows the user to manage all targeting information. The tree displays current targeting information and planned targeting information. The user can reference the Target List Critical window section of the TB to familiarize himself with the window.

H.1 Key AFATDS Target Definitions

Target Data. Target data is grid producing information received at AFATDS via a fire request (e.g., a call for fire received from an observer or a fire mission initiated by an AFATDS operator), or intelligence information (e.g., ATI report received from an observer). Target data is also produced by AFATDS. For example, AFATDS uses intersecting target indicator rays to determine a grid location, thereby generating target data.

Target. A target is target data that has passed target selection standards, and therefore, is worthy of attacking because it meets the commander's criteria for reliability, accuracy, and timeliness. Targets undergo further mission processing to determine if a fire mission is executed based on comparisons to additional targeting and attack guidance, the target's relative value to other targets, and if attack systems are capable of engaging the target.

Target Indicator. Target indicators represent directional information that forms a ray (line) from a given point, in a given direction, to a derived maximum distance along which a possible enemy target may be located. Examples of target indicators include shelling, flash, and jam strobe reports. A target indicator will have a target type (e.g., "Artillery, Unknown", "EW Equipment").

Suspect Target: A suspect target is target data that has failed target selection standards and may not be worthy of attacking because it does not meet the commander's criteria for reliability, accuracy or timeliness. Suspect targets are further refined until they pass target selection standards, the operator initiates a fire mission on the suspect target, or the suspect target decays (based on target decay guidance) and is deleted from the suspect target list.

When selected, the default list is the Current Active Target List. It is important for the leader to understand how AFATDS manages targeting information. Target windows should be refreshed often to ensure the user is seeing the most current data on the targets as they are viewed.

Target Lists maintained in the Target List window, Current Folder are:

- Current Active Target List
- Current Inactive Target List
- Current Planned Target List
- Current On Call Target List
- Current Suspect Target List
- Current ATF Target List
- Named Target List

Current Active Target List: This list contains all targets that are at an intervention point (IP) or are in the process of being fired.

This list can also contain duplicates of fires request in the case of Immediate Air Missions. If an Immediate Air Support Request is sent up the air chain, the target information will remain in the current active target list referenced by artillery target number.

Targets that are in this list can be have their status traced to determine what phase a fire request is in. Messages can also be sent on active targets such as Fire, Commands, End of Mission or Mission Fired Report. To status or send messages the user opens the target list, highlights the active target them right clicks on it. A drop down menu will display from the drop down list the user can select the action desired.

NOTE

Status contains a list of messages that have been transmitted or received, the unit that conducted the action the Type and the time. Below is a list of the more common types seen in a Target Status window. Fire Request, Fire Order Check Fire (used to show the initiation and cancellation of check fire) Commands (Message to Observer, Shot, Splash, Rounds Complete) Fire, Adjust, Record as Target, and End of mission, Mission fired Report.

Current Inactive Target List: Contains a list of all targets that have been fired upon. Inactive targets can also be statuses traced.

Current Planned Target List: Contains targets that have been reported as an ATI, and then a determination is made to see if the target is a High Priority Target (HPT) and is planned. If so, the target is added to the planned target list.

(Intervention Tabs. If a user changes precedence to Planned (i.e., P) and then selects Accept Recommendation or Send Selected, the mission will be placed on the planned target list and a "deny" will be sent to the originator of the fire.)

Current On Call Target List: Contains a list of all targets that are in an On-Call status. Targets in a Plan on a Planned targets in the master list are added to the On Call list when a phase is implemented to the current situation.

Current Suspect Target List: Suspect target is target data that has failed target selection standards and may not be worthy of attacking because it does not meet the commander's criteria for reliability, accuracy or timeliness. Suspect targets are further refined until they pass target selection standards, the operator initiates a fire mission on the suspect target, or the suspect target decays (based on target decay guidance) and is deleted from the suspect target list.

If the ATI fails the TSS guidance it will be considered a "Suspect" target and be sent to the target generation function for further processing automatically.

The "Check Call for Fire against TSS" box must be checked in the Target Selection Standards section of guidance's in order to enable CFF Suspect target processing.

Current ATF Target List: Contains a list of all Amphibious Task Force target list developed in a Plan and then activated for the current situation.

The target list is developed in a Plan; the user specifies the ATF entry (Classification, Priority and Part number) on the More Tgt Data Tab when establishing the target. This will automatically force the target to be placed in the ATF Target list when it is implemented into the current situation. The ATF list allows the user to use the Status Code in the More Tgt Data Tab to track the ATF targeting process.

Named Target List: Contains all named target list such as Prep fires, groups, series, named Air Support List, etc.

Default ASL Current Target List: If no ASL is in the AFATDS and a request for Immediate Air is processed the system will generate a Air Support List named, by default, ASL CURRENT as a place holder.

If a plan exists in AFATDS a target list is maintained in a folder listed as that plans name. If one does not exists then a placeholder for planning named SOP Phase 1 is in the tree. SOP Phase is a placeholder and should not be used by the operator.

The Target Lists maintained in a Planned folder are:

- Named Target List
- MASTER Target List

Named Target List. Contains all named target list such as Prep fires, groups, series, named Air Support List, etc.

The MASTER Target List. Is a placeholder folder for all targets that are built in a plan. If a target is built into a group and that same target is also placed in a series then that target will be listed

twice in the MASTER target list. This list is used by the system to track the targeting that is built into a plan and should not be manipulated in any way by the user.

H.2 Suspect Target Processing

Suspect Targeting can be found on the AFATDS Current Toolbar under the Targets dropdown menu > Suspect Target Processing. The operator may turn Suspect Target Processing “on” or “off”. AFATDS defaults suspect targeting to the “off” position. Suspect target processing requires that the unit examine the units in its database and ensure that they reflect the correct TLE accuracy. AFATDS uses the following TLE unless otherwise specified by the operator in the unit data.

Table V. Target Location Error

Sensor Characteristics			
Sensor Type	Laser On Hand	Target Location Error (TLE)	Sensor Directional Error (Mils)
FO	Yes	80	10
FO	No	400	10
FIST	Yes	80	5
FIST	No	400	5
COLT	Yes	80	5
COLT	No	400	5
Observer not FA	Yes	80	5
Observer not FA	No	400	5
Air Observer	Yes	270	5
Air Observer	No	400	5
Naval Observer	Yes	80	5
Naval Observer	No	400	5
Mortar Observer	Yes	80	5
Mortar Observer	No	400	5
ANGLICO	Yes	80	5
ANGLICO	No	400	5
AFAC	Yes	270	5
AFAC	No	400	5
FCT	Yes	270	5
FCT	No	400	5
Radar AN/TPQ 36	N/A	100 or 1% of range	1
Radar AN/TPQ 37	N/A	90 or 0.9% of range	1
Radar JSTARS	N/A	400	1
All Others	Yes	400	5
All Others	No	400	5

When Suspect Target Processing is turned off, all suspect targets are added to the Suspect Target List with no further processing.

When Suspect Target Processing is turned on, AFATDS evaluates each received suspect target against other suspect targets in an effort to combine the new suspect target with an existing suspect target. This is done to generate a target with a better TLE and/or DTG sensed (remember that these are the key factors in the TSS check).

Suspect target’s received while processing was off, will not be compared for target generation. When Suspect Target Processing is turned back on, only newly received suspect targets are

processed. If the operator feels a Suspect target on the list should be processed, opening the edit window and closing via OK causes the suspect target to be submitted for processing.

The following considerations are applied by AFATDS when determining which targets to combine as well as the target data for the ”new” (combined) target:

- Only suspect targets that have not surpassed their decay DTG are considered for combination.
- Only targets with a similar type will be considered for combination. For example, an “Artillery, Unknown” target would not be combined with a “Building, Metal” target.

The target size, increased by the TLE, for the new and extracted suspect targets is used to determine overlap.

If an overlap exists between the new target and a single existing target and the overlap area meets or exceeds the operator-established percentage of overlap required, then the two targets match. The Overlap % tells AFATDS how close two targets must be (considering the area and TLE of each target) in order to combine them. Figure 14 shows some examples of this comparison.

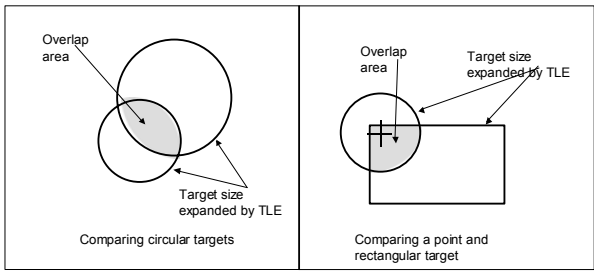

Figure 14. Examples of Overlap

If multiple overlaps exists between the new suspect target and two or more existing suspect targets and each overlap area meets or exceeds the operator established percentage of overlap required, then the following rules apply:

The suspect target with the greater degree of similarity to the new suspect target is combined with the new suspect target.

If the degree of similarity is the same, the suspect target with the greater degree of overlap with the new suspect target is combined with the new suspect target

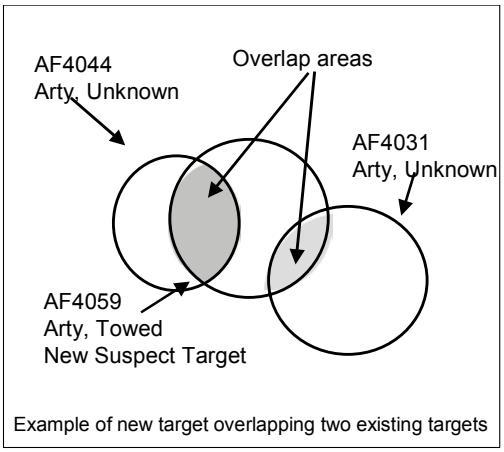

Figure 15. Overlapping Two Targets With a Third Target

When two targets are combined, the new target is sent to TSS for further processing. Both of the “parent” targets (the two that were combined) are removed from the suspect target list.

Targets are matched first by similarity of target type. If the received suspect target matches a suspect target on the list, the targets are then checked for area overlap. The darker areas at the right indicate the area of overlap for two circular targets and a point/rectangular target overlap. If

either target is overlapped by the value entered in the Minimum Overlap (%): field on the Suspect Target List window, the targets are combined and a target is generated.

The overlap percentage is computed by dividing the area of overlap by the area of the suspect target. As an example, a circular target with a radius of 50 meters contains approximately 7854 square meters. With an overlap of 1600 square meters, the overlap would be 20% (1600 divided by 7854).

The type, size, TLE, and location of the individual targets are used to determine those values for the combined target. The target type of suspect target with the smallest TLE is used as the combined target type. If the TLE's are equal, the suspect target with the most recent DTG is used as the target type. The combined target will be circular and contain the same area as the larger of the two suspect targets being combined. The TLE of the combined target will be the same as the smaller of the two TLE's of the combining targets.

Location of combined suspect targets: The location of the combined target is determined by the distance between the center points of the suspect targets and the ratio of their TLE's. The location of the combined target will be on a line drawn between the centers of the combining targets. To establish the point on the line, a ratio of the target TLE to the total of the TLE's is used. As example, if the TLE's are equal (30 each for a total of 60) the ratio would be ½ (30/60). The combined target center would then be half way between the two targets. In Figure 16, the total TLE is 100 (75 + 25). The ratio for the point target is ¾ (75/100) so the center of the combined target would be ¾ of the distance between the targets from the point target. Using the rectangular target in the same manner locates the combined target ¼ of the distance from the target (the same location).

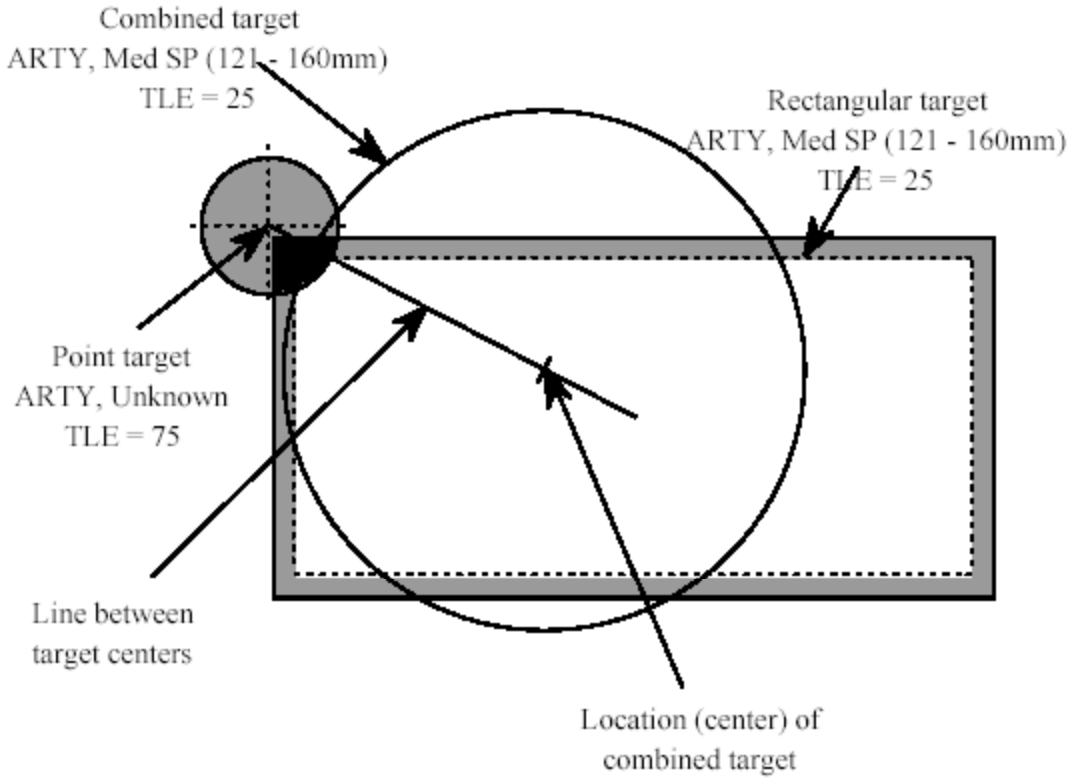

Figure 16. Locations of Combined Suspect Targets

The target strength of the combined target will be the same as the larger of the two targets strengths of the combining targets. The degree of protection of the combined target will be the same as the higher level of the combining targets.

The combined target will use the target elements, countermeasures, and environment of the combining target with the smallest TLE or most recent DTG, as applicable. If less than three are available, data elements from the second combining target will be used as a supplement.

Suspect targets are combined two at a time. If multiple matches occur for a received suspect target, the targets with the most similarity are combined. If the similarity is equal, the targets with the most overlap are combined. There is a high probability that, if the combined target fails TSS upon processing, the combined target will again match the previously matched (uncombined) target and a combination will occur. When two suspect targets are combined, the data for the targets (parents of combined target) is saved should the operator elects to “un-combine” the targets. If a combined target and another suspect target are combined, the combined target becomes one of the parents and its parent data (i.e., grandparent data of the newly combined target) is deleted from the database.

When two suspect targets are combined, the combined target is submitted for processing. The target is processed in the same manner as a received ATI. The combined target is not added to the Suspect Target List window until it has failed mission processing. If a combined target was constructed from two suspect targets that failed TSS for the same reason, the combined target will also fail for this reason.

As example, two suspect targets that failed TLE checks are combined to form a target that has a TLE of the suspect target with the smallest TLE. This TLE is still in excess of TSS limits and will fail.

Managing Suspect Target Processing: The operator may specify the “Overlap %” to be used by AFATDS when considering targets for combination. A larger percentage (like 75%) will result in fewer, but more accurate, combinations than a smaller percentage (like 25%). As with the target indicator list, the operator may decide to have the suspect target list purged of targets when their “decay time” DTG is passed. To do this simply select “automatically purge” option on the suspect target list window. Finally, the operator may see the targets on the suspect target list that were generated by AFATDS (these will be the targets that have a “yes” in the “Combined?” column of the list). There is an option to “uncombine” a combined target if desired.

APPENDIX I
CONTINUITY OF OPERATIONS (CONOPS)

I.1 CONOPS with AFATDS

Continuity of Operations (CONOPS) provides AFATDS the capability to perform processes where one OPFAC assumes the critical fire mission processing functions of another OPFAC. OPFACs must shut down temporarily to displace to new locations or shut down unexpectedly due to equipment failure or enemy action, these situations limit the mission of the unit. The CONOPS process is designed to allow a designated "backup" OPFAC to assume the mission-processing role of another.

CONOPS provides the means to designate a **primary and secondary backup unit** for all OPFACs in order to conduct continuous operations for any unit temporarily shutdown. This process provides means to transfer active mission data between OPFACs, subordinate units and continuation of the missions when passing control to a backup unit. An automated data distribution scheme is incorporated to keep the databases at backup OPFACs in close conformance with their supported OPFACs' databases. The databases must be real time compatible and must mirror all the database information between the OPFACs participating in the process.

The Principal Unit is defined within the CONOPS procedures as the unit going down and requires a backup system to continue its mission. The Principal Unit provides database updates with other OPFACs before, during, and after the CONOPS operation.

The Backup Unit that will assume control of the Principal Unit's role will inherit all mission processing responsibilities to include command and of the Principal's subordinate units. The Backup Unit also, provides database updates to all OPFACs before, during and after the CONOPS operation.

Satellite Units are defined as those units belonging to the Principal Unit and are considered as commanding, subordinate, supported, and supporting units. The Satellites' input and data exchange will be minimal however, required for a CONOPS operation to be successful.

Operational Threads for CONOPS consists of four major operational threads that must be completed by each specified OPFAC to establish and execute the process.

CONOPS Setup is thread that describes the operator actions necessary to enter and maintain the appropriate CONOPS information in the AFATDS database.

The Execute planned CONOPS thread describes the actions taken when a backup OPFAC assumes control for a principal OPFAC. In a planned CONOPS transition, the Principal Unit executes an orderly transition and shutdown procedure.

The Execute Unplanned CONOPS is completed without the participation of the Principal Unit. Usually this situation is generated through poor communications capabilities or a catastrophic failure on the part of the Principal Unit. The Backup Unit assumes control for the Principal Unit, but in this case there is no opportunity for an orderly transfer of control. In an unplanned transition, the principal shuts down suddenly and unexpectedly.

The Terminate CONOPS is the thread that describes actions taken when the Principal Unit is ready to resume its normal mission. It describes the orderly return of control from the Backup Unit to the Principal Unit.

In some non-AFATDS systems, only one communications plan can be stored. This is sometimes referred to in non-AFATDS systems as the Subscriber Table or the Routing Table. In AFATDS any number of communications plans can be stored, while only one of which can be active. These stored plans are known as Planned Configurations, while the active one is known as the Current Configuration. Having multiple configurations allows Continuity of Operations (CONOPS) planning in case an OPFAC were to be lost due to movement.

Guidance contains CONOPS OPFAC backup designations for FSE/FSCC, FA CP/FDC, and Fire Unit FDC OPFACs. The operator may manipulate this guidance in order to specify backup units

(primary and secondary) for specified OPFACs. This guidance serves as a “notebook” for the operator. This data is information only and has no function or associated processing.

Data distribution is the way AFATDS ensures information is the same between many different OPFACs. This allows units processing fire missions to have correct data about subordinate units and allows CONOPS backup units to have necessary data if they need to go into a CONOPS mode. Distribution lists and distribution criteria are the two major parts that make up data distribution.

A **distribution list** contains a unit or a group of units, which you can select to transmit information to. When sending information about units, geometries, etc., either a destination unit or a destination distribution list can be selected. AFATDS has seven (7) default distribution lists with two, which are used for CONOPS operations.

The Primary CONOPS from the Primary CONOPS entered on your Unit Information. This field is automatically populated when your unit information is completed and saved.

Secondary CONOPS from the Secondary CONOPS entered on your Unit Information. This field is also automatically populated when your unit information is completed and saved.

When AFATDS sends summary information (either due to automatic data distribution or due to operator “push”), AFATDS provides some special behavior. If the destination unit for the summary data is the OPFAC that backs up your OPFAC (i.e., your primary or secondary CONOPS unit), AFATDS will not distribute summary data to that unit.

The Backup unit does not need your summary data since it will calculate a summary (by “rolling-up” data maintained for your subordinates in his database) for your OPFAC anytime the operator actions for viewing or transmitting your unit data occurs. The Backup Unit should be receiving all of the Principal Units’ subordinate’s updates thorough automatic data distribution. The distribution criteria to let this happen must be established and maintained.

NOTE

If you are an FA CP, make sure you set your distribution criteria to send “This Units” basic unit data, general unit data, ammunition summary, and weapon summary to your command and supported units. This is necessary so they can perform unit level attack analysis on your unit.

I.2 CONOPS Setup

Preliminary setup for CONOPS support is essential to success. Before an operation starts, knowledgeable personnel must develop a plan for CONOPS support, designate CONOPS assignments, and provide this information to all concerned. All OPFACs must then enter CONOPS information in their respective systems in accordance with this plan. CONOPS assignments are typically made and disseminated to AFATDS OPFACs using the ‘CONOPS - Unit Backups’ table, found under the Guidances/ Miscellaneous pull down menu.

I.3 CONOPS Capabilities

AFATDS stores additional CONOPS data relationships as part of unit data.

A CONOPS Checklist window provides detailed instructions to guide the operator through the steps in the CONOPS process. The operator can amplify the instructions in the checklist with additional text input. This allows the operator to write “reminders” to himself regarding complex steps in executing CONOPS transitions. This is especially useful in recalling communications setup details. This checklist is information only and the instructions are tailored to guide the operator through Planned CONOPS, Unplanned CONOPS, and Terminate CONOPS.

Provides the capability to transmit planned communications configurations between OPFACs. In this way, a single OPFAC can develop comm. configurations for the CONOPS operation with participating OPFACs and transmit the configuration, which the receiving OPFAC can readily implement with only minor modification.

Provides the capability to automatically archive the AFATDS database at an operator specified time interval. This assists an OPFAC, which experiences an unexpected failure in recovering quickly with minimal data loss.

Provides the capability for any backup OPFAC, regardless of role, to perform the same level of attack analysis as performed by the principal OPFAC. In order for CONOPS to work properly, any unit assuming another unit's mission must duplicate the mission processing functions inherent in the "supported" and "command" relationships. The backup unit must respond to fire requests/orders from the principal's "supported" unit(s) and must exercise control over the "commanded" units.

CONOPS Information

AFATDS provides a **data entity** (a subset of unit data) for storing CONOPS information. This information and its data entries are accessed through the unit's Basic information and selecting the CONOPS subset. This action displays the CONOPS Information window, which provides operator entry of data required for CONOPS setup and execution.

The entry in the "Address Missions To" indicates whether or not a CONOPS transfer of control is in effect for the unit shown in the Unit ID field. The operator should become familiar with and understand how to interpret them. These entries help to identify the phase CONOPS is currently in. There are three (3) selectable entries used in this field.

- "Principal" is the default entry, which indicates normal operations (i.e., no CONOPS is in effect for the current time). During this phase data distribution should be setup to allow for exchange of information between participating OPFACS. OPFAC databases must be identical and maintained to the Current Situation to support the execution of CONOPS.
- The Primary entry indicates that the unit listed in the Primary Backup field has or is assuming control for the Principal Unit. This entry is associated with the Active Unit Organization and Mission Routing checkboxes.
- The Secondary entry indicates that the unit listed in the Secondary Backup field has, or is assuming control for the principal unit. The Secondary Backup is an additional unit that may be used when the Primary Backup Unit is not able to perform CONOPS operations.

The **CONOPS Information window** displays two checkboxes, which enable and disable functions within the CONOPS process. These checkboxes may be used individually or together to achieve desired results. The checkboxes are normally defined as on/off switches.

The "Active Unit Organization" checkbox field is enabled only if the Primary or Secondary is selected in the Address Missions To field. An entry here indicates that the unit in the "Address Missions To" field has assumed the command and support relationships of the Principal OPFAC.

Mission Routing: Entries are "on" or "off". This field is enabled only if Primary or Secondary is selected in the Address Missions To field. An entry here causes the backup OPFAC to assume the principal's position in the mission processing chain. When the principal OPFAC performs a planned CONOPS transition, the operator makes entries in all three fields at once (Address Missions To, Active Unit Organization, and Mission Routing) to cause AFATDS to transmit the principal's active mission files to the backup OPFAC. At the backup OPFAC, simultaneous entries in these three fields cause the backup to transmit active target list query messages to the principal's subordinate, higher headquarters, and supported units.

Primary Backup: The unit entered here is the designated primary backup OPFAC for the principal, i.e., the unit listed in the Unit ID field. It is the unit that assumes control when Primary is selected in the Address Missions To field.

Secondary Backup: The unit entered here is the designated secondary backup OPFAC for the principal, i.e., the unit listed in the Unit ID field. It is the unit that assumes control when Secondary is selected in the Address Missions To field.

Active Command, Active Supported: The entries in these fields are for information only, and have no impact on processing.

Unit Backed Up (1, 2, 3): The unit entered here is the unit receiving the backup services of the unit shown in the Unit ID field on the form. AFATDS will not allow the operator to initiate CONOPS unless the entry in this field in the primary (secondary) unit's CONOPS data corresponds to the principal OPFAC initiating the CONOPS scenario (e.g., FSE MAIN, the principal unit, wishes to initiate CONOPS with FSE TAC as the primary backup). The unit data

for FSE TAC must show FSE MAIN in one of the Unit Backed Up fields, or the FSE MAIN OPFAC will not allow CONOPS to be initiated.

I.4 CONOPS Guidelines

Make backup assignments 'reciprocal' when possible, (i.e., if A backs up B, then B should also backup A).

Backup units should have similar roles and unit echelons.

Backups should have the same zone of operations and battlefield tasks as the principal.

To the extent possible, MAKE BACKUP ASSIGNMENTS HABITUAL! CONOPS is a complex process. It requires training and rehearsal. Soldiers will be able to execute more effectively if they work with the same unit routinely.

I.5 CONOPS Checklist

An associated communications configuration: If the CONOPS scenario in question requires extensive changes to communications, a planned communications configuration can be built and stored beforehand, and it's name stored with the CONOPS information. The operator will be prompted to implement this planned comm. configuration as part of the CONOPS procedure.

A "CONOPS Checklist." Window. This will be displayed to the operator as a new window. AFATDS stores and displays five versions of this window, reflecting the five unique CONOPS situations:

- Initiate Planned CONOPS—Principal
- Initiate Planned CONOPS—Backup
- Initiate Unplanned CONOPS—Backup
- Terminate CONOPS—Principal
- Terminate CONOPS—Backup

It contains the following:

- A list of all steps to be executed by the local OPFAC for the CONOPS scenario
- Each of the steps has an associated free text field within which the operator can enter additional text.
- The checklist window has a status indicator for each step in the checklist. As the operator completes the associated action, he enters a character in the checklist column to show completion.

NOTE

The detailed steps necessary to Setup and Execute CONOPS in the Planned and Unplanned operations, and the steps to terminate CONOPS may be found in the help function of the AFATDS system. The steps may be printed out for study away from the system.

APPENDIX J
MASTER UNIT LIST

J.1 Master Unit List Information

Unit information for the Master Unit List commonality has to be resolved at the highest possible level to ensure that each unit is given a unique designator. Each major headquarters will have to assign Unit Numbers to their subordinate units and provide the Unit ID (IAW military standards) to ensure the units are correctly listed in the MUL.

The Command and Control Registry (C2R) application programs within the AFATDS software provide ABCS Master Unit List and communications configuration data for the ABCS components. AFATDS exchanges unit information with the JMCIS Database. AFATDS constructs a JMCIS alias based upon the JMCIS unit identifier received on friendly and enemy unit information between AFATDS and JMCIS. This process requires no operator intervention. The process is automatic between the AFATDS and JMCIS databases.

AFATDS performs checks using the MUL when creating and updating the units in the current situation. Creating or updating unit information in the current situation is checked against the MUL in order to create a new unit or to update an existing unit to the Current Situation.

The "Options" Menu contains selections for "Importing" and "Exporting" the Master Unit List. Import or Export of the MUL may be performed to incorporate the use of magnetic media: Floppy disc, Flash Card, and OD/CD. The C2R Merge Tool within the AFATDS software is intended to facilitate the identification of discrepancies between two files, providing the basis for updating of the existing AFATDS Joint Master Unit List (JMUL). The JMUL is used to manage the data from which the fielded AFATDS Master Unit List (MUL) is derived.

Currently the MUL and JMUL are controlled and managed by the CTSF, Ft. Hood Texas. Military units must provide the required information to the CTSF in order to be added to the MUL. CTSF uses an LDIF file with the C2R Merge Tool to correctly manage the MUL.

The C2R Merge Tool provides for the comparison of two government-provided LDIF files to electronically detect/identify discrepancies between a specific subset of unit parameters. Specifically, a "new" LDIF file is to be compared against the "old" LDIF file, which corresponds to unit information currently contained in the JMUL. Discrepancies identified will provide a basis for updating of the JMUL.

The comparison criteria is defined as a subset of the values associated with each unit which is comprised of the combination of the Role, unit name, URN, Org ID, and/or name parameters.

Discrepancies to be reported include: New Units, i.e., any unit in the "new" LDIF file for which none of the individual parameters of the [Role, unit name, URN, Org ID, or-name] subset exist in the "old" LDIF file. Altered Units, i.e., any unit for which there is only a partial match of parameters of the [Role, unit name, URN, Org ID, or-name] subset that exists in both LDIF files. Deleted Units, i.e., any unit in the "old" LDIF file for which the entire combination of parameters of the [Role, unit name, URN, Org ID, or-name] subset does not exist in the "new" LDIF file.

NOTE

AFATDS OPFACs should not be placed in the classified mode until all of the administrative database work is complete. Master Unit Lists can be Archived/Imported at any time regardless of the classification of the OPFAC. It is important to realize though, that importing a Master Unit List will not append to your existing list, it will replace the existing list with any differences between the two lists being lost. Extreme care should be taken when importing a Master Unit List to ensure that any units that are in the current situation or in any fire support plans are represented by the same Master Unit List number that they originally had.

Master Unit List Window allows the user to manage the listing of all units in the system. Unit data entered and maintained includes the unit ID's, aliases, and system type. The user can create, edit, or delete units. Functions are also available to import the list from or export the list to an optical disk. In order for AFATDS to operate consistently and correctly, it is critical that the master unit list be maintained in a consistent manner across the entire system, meaning all

AFATDS OPFACs. Under normal circumstances, the master unit list should be administrated by a single higher headquarters and distributed to all other AFATDS equipped units via the master unit list Export and Import selections.

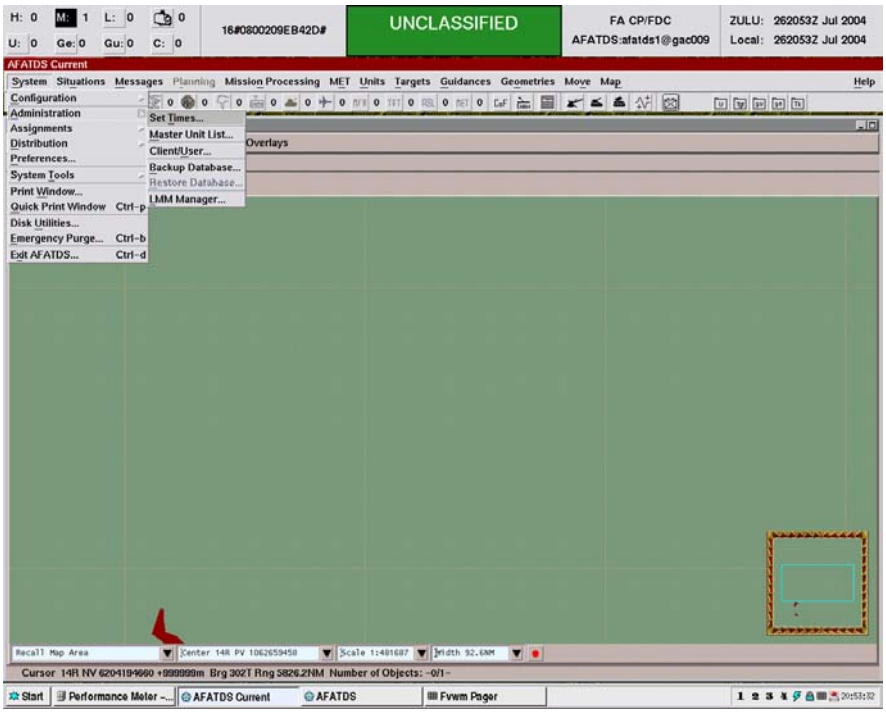

Figure 17. Accessing the MUL

To the extent that is practical, changes to the master unit list subsequent to deployment should be minimized. Deletion of a unit from the master unit list is discouraged since database integrity may be compromised if references to the deleted unit still exist in any database at any AFATDS OPFAC.

NOTE

Any modifications to the Master Unit List should be avoided if possible. If modifications are necessary, this section must be read prior to making modifications and/or deletions. When in the current or planning situation, modifying a Unit ID on the Master Unit List (MUL) requires that the map must be closed (hidden) and/or the operator must exit the situation before the change to the Basic Unit Info window will take place.

Master Unit List Filters: The Master Unit List can be filtered in several ways that will help the operator to find specific units or types of units. This is extremely useful when the number of units on the list is in the thousands. The list may be filtered by any combination of the following:

- Master Unit List Number (To - From)
- System Type(s)
- Unit ID (Filters out units whose name does not contain the text you identify in each field of the unit name. If you leave the asterisk (*) in a field, then that field will not be considered in the filter.)

These Master Unit List filtering features may be used while performing any of the functions that present the Master Unit list as the list to select from (Communications Configurations, New Units etc.). It is important to note that if the Master unit list has been filtered; the list will be presented with the filter applied anytime it is accessed.

J.2 Units Stored to the MUL

AFATDS uses a Master Unit List to store all Unit IDs, which can be used for Unit Status and Communications.

For each Unit ID, the Master Unit List stores a Unit Reference Number, a Unit Identification Code (UIC), a System Type (for example AFATDS, BCS, FIST DMD, ATHS, etc.) and optional Aliases.

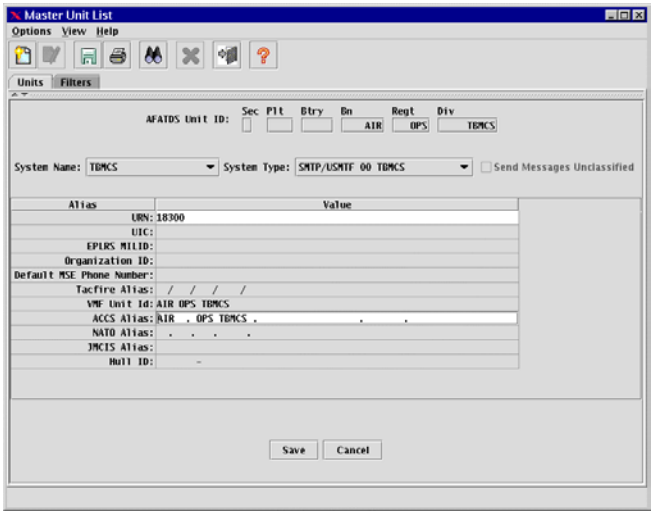

Figure 18. Edit Unit Window

In order to edit a unit in the Master Unit list, access the Edit Unit Window

Edit Unit window AFATDS Unit ID Unit #

- AFATDS Unit Ids: Each unit in AFATDS is assigned a Unit ID. The Unit ID is displayed on windows and printed out on reports. It is entered in the Master Unit List as six separate fields but is shown as one 33-character word on windows and printouts. The fields in the Unit ID are meant to be echelon fields but you can enter anything in them you need. Figure 18 shows the echelon and the number of characters in each field.
- Division, Corps or EAC - 10 char
- Brigade or Regiment - 7 char
- Battalion or TF - 6 char
- Battery or Company - 5 char
- Platoon - 4 char
- Section or Lower - 1 char
- 1 A 1-41FA 52 DA
- Unit IDs are not sent to other systems.
- Unit Reference Number: AFATDS uses unit reference numbers to store and exchange data.

NOTE

Unit Reference Numbers must be the same between AFATDS OPFACs for data distribution, communications and unit status updates to work correctly. This requires a unit at Division or Corps level to maintain a common Master Unit List as well as any updates or changes to the Master Unit List.

System Type: AFATDS formats and deciphers messages based on the System Type of the Unit we are talking to. Therefore, it is very important to have the proper system type specified for the unit.

NOTE

If the only way to talk to another unit is to set it to a wrong, but similar, system type, something more serious is wrong either with the device or with AFATDS. Further troubleshooting is required.

Unit Reference Number: The "Unit Reference Number" must be entered when communicating with devices that use "URNs" such as Pkg11 BCS. When creating certain "System Types" this field will be a required entry and AFATDS will present the operator with an alert if needed. The "VMF Unit Reference Number" can be the same as the "AFATDS Unit Number".

Alias (TACFIRE, ACCS Alias, NATO Alias, and JMCIS Alias): For non- AFATDS systems (e.g., TACFIRE, BCS, ABCS, etc.), an ALIAS is entered into the Master Unit List, which must be the same as what the other system has as its unit ID (or subscriber ID).

- OPS 1-37 FA 616 AFATDS O/P/S/1/37
- 1 BCS A 1-37 FA 603 BCS B/1/A/1/37
- A 63 FA 640 AFATDS //A//63
- 1 FDS A 63 FA 642 MLRS/LAN

AFATDS uses the unit number to identify units. Whenever it displays them on the screen it uses the Unit ID. Other systems use different methods: TACFIRE systems (IFSAS, BCS, FDS, FED, etc.) uses a subscriber ID like "B/1/A/2 /82", EPLRS uses a MILID like "FS1-79-2", etc. When another system sends AFATDS a message, AFATDS must "translate" their unit ID into an AFATDS unit number and unit ID. Using the "aliases" performs this action. The aliases for a unit are entered in the Master Unit List and include the following:

- Default MSE Phone Number
- EPLRS MILID, TACFIRE Alias
- NATO Alias
- MTS Call Sign
- ATCCS Alias.

For an example, suppose that the TACFIRE alias for unit "1BCS A 2-82 FA" (unit number 17) is "B/1/A/2 /82 ". If a TACFIRE device (e.g., BCS) sends us a message about "B/1/A/2 /82 ", AFATDS will look that up in the Master Unit List, find unit number 17, and know the message is about the unit "1BCS A 2-82 FA". If the TACFIRE device would have instead sent us a wrong subscriber ID, like " /B/1/A /282", AFATDS would have looked in the Master Unit list and not found a matching Alias and could not have processed the message. This illustrates the importance of having correct alias data entered in the Master Unit List.

NOTE

All units talking to non-AFATDS systems must have the correct alias entered. The AFATDS OPFACs, which talk to these units, must have the correct Alias entered as well. As a rule: any unit ID alias entered in a non-AFATDS device must have the same setting in the AFATDS Master Unit List.

Master Unit List Window Navigation: The Master Unit List (MUL) window is opened via the System\Administration\Master Unit List selection. The Options window menu contains selections used to open the import and export windows. New and Edit buttons open the Edit Unit window used to create and edit unit data. The Filters button opens the Unit List Filters window. This window allows the operator to filter the units displayed on the MUL.

J.3 Master Unit List Window Functions

Display: The Master Unit List window displays the Unit ID, System Type, and Unit Number for all units contained in the system that are selected for display. Up to 16,777,214 units may be contained in the unit list. The units are displayed on pages of up to 200 units each. The user moves from page to page using the Previous and Next buttons. The pages are then scrolled to view the units on that page. The user can reduce the number of units displayed by setting filters for specific unit numbers, system type(s), and/or unit ID's. Filters are set by selecting the Filters

Tab to open the Unit List Filters window. The Filtered By: field will display the types of filters set for the display.

New: The “Master Unit List” window is used to create “New” units in the “Master Unit List”. Each time a new unit is created the “AFATDS Unit Number” will automatically increase to the next available number. This field can be edited to make entries.

Edit: Edit those units that have already been created

Delete: This function allows the operator to select a specific unit to be deleted from the MUL.

J.4 Command Support Relationships

There are various ways in which the Command and Supported HQ entries are used within AFATDS.

In Attack Analysis the Command Support is used in processing a mission to determine the available attack assets. Any directly supporting Naval Ship, Aviation, Air, and Mortar assets are used as is any FA units in the Command chain or the Supporting chain. (The chain is found by looking at all subordinates and all supporting units for the units listed above.

Several data distribution lists are automatically created for you based on Command HQ and Supported HQ information in the database. These lists cannot be edited, but they are automatically modified when you change your or your subordinates Command HQ or Supported HQ information.

When initially developing a Schedule of Fires, the attack assets presented are found by looking for all attack assets in your Command or Supported chain. When disseminating a Schedule of Fires to an FA CP, only the schedules for those units, which are in his Command or Supported chain are sent.

When viewing a unit’s Summary Supply Information (POL, Equipment, Weapons or Ammo), that unit and all units showing him as their Command HQ are displayed.

Any unsupportable targets will be sent to your OPFACs Supported HQ if you select the “Unsupportable” button on the Intervention window.

Coordination of ZOR’s is based on the Support HQ relationships. A mission will require coordination with a ZOR if the observer, his Supported HQ, or the originator of the mission is not the same as the responsible unit for the lowest echelon ZOR’s that enclose the target area of ZOR’s is based on the Support HQ relationships. A mission will require coordination with a ZOR if the observer, his Supported HQ, or the originator of the mission is not the same as the responsible unit for the lowest echelon ZOR.

Priority of Fires in Mission Prioritization will be processed and assigned a Priority of Fires ranking for Priority of Fires, or if from an Observer, Observer’s Supported HQ is the originator of the mission.

The Command Support Relationships not only enforce the unit’s Tactical and Technical standard operating procedures (SOP) for the battlefield but also, provide the required information and data used by AFATDS to perform computer-based processes. The Command Support Relationships are part of a unit’s basic information. The Current Command Unit ID and Current Supported Unit ID are two entries in the AFATDS unit information that are used in association with various processes throughout the AFATDS system.

- The Command Support Relationships play an important part of how AFATDS performs missions, distributes information and controls supply information. Without the proper command and support information entered into your system, AFATDS will not operate properly.
- These relationships are entered in the General Unit Information window for units. This information may be operator selected for input and applies to any unit in the Current Situation. This process will display the command and/or supported units for the current or planned situations, as indicated by the operator.
- The unit data will contain all information concerning an AFATDS unit (i.e., a friendly non firing unit, service battery, headquarters element, fire Support Element, FA CP not directly in control of the weapons, etc.). When a friendly unit is created in the Current Situation the command and

supporting relationships, CONOPS backup units, supported Headquarters, Command Headquarters established in the specified unit become associated with those units selected.

- For units, which control fire units the Command Support Relationships will generate rollup data consisting of munitions status summary, and unit range fan summary information in the Detailed Information window. For FSEs, which control fire units such as a mortar unit, of operator entered mission saturation value and response time will be displayed in the Detailed Information window. Command Support Relationships generate unit information based on echelon and organization structure.
- The Command Support Relationships will display the unit organizational structure to depict either the command/or supported structure for current or on-order assignments, for either current or planned units, based on operator selection. The higher command and/or subordinate units will be displayed through operator selectable menus for Current Command and Current Supported.
- The Command Support Relationships will also be used when performing Mission Processing Attack Level Analysis. Only the Unit and Detailed are affected by these relationships.

FS System Attack Analysis allows an FSE to perform attack analysis only to the level of detail necessary to select a FS system and get the mission to the appropriate unit for further processing. The level of analysis is to be used primarily at an FSE OPFAC. When performing FS system attack analysis, detailed unit information (locations, munitions status, active missions at the unit, etc.) is not required.

The comprehensive analysis (determining actual range, determining munitions quantity to fire on a target to cause 30% effects, etc.) is performed by the FS system selected in the fire missions' Attack Options. When an FSE uses FS System Attack Analysis and selects FA cannons as a system, the mission is given to the FA unit (unit that is specified to handle missions assigned to FA) for further analysis and execution.

Unit Attack Analysis allows an OPFAC to conduct more detailed attack analysis using 'rollup' unit information. This level of analysis would normally be used in higher level FA CPs (CORPS ARTY, DIVARTY, and FA BDE). Fire units directly supporting or commanded by the OPFAC performing the analysis are analyzed using unit data (location, munitions capabilities, operational status, etc.) to determine if they can attack the target and achieve the specified defeat criteria. When an intermediate FA CP exists, AFATDS simply determines if the unit (e.g., FA Brigade, DS Battalion), based on a set of general capabilities, can attack the target.

Detailed Attack Analysis allows an OPFAC to determine and evaluate all available individual fire units (as well as collective groupings of fire units for massing) against the given target. This level of analysis is used in lower level FA CPs (battalions), and at FSEs (who have subordinate fire units) or higher-level FA CPs that command or have subordinate fire units assigned. The Detailed Attack Level Analysis uses the Rollup data associated with the Support Command Relationships to generate firing data and fire mission related messages.

Command Support Relationships information: There are two data entries within the unit information window that allow the AFATDS operator to input this information.

- Current Command Unit ID is used to enter the unit who commands another unit or the unit another unit is attached to. Basically this is your next higher echelon. This data will also populate or update the Current Command list in the Unit Organization window.
- Current Supported Unit ID is the unit to whom another unit is DS, R, GSR or GS. The unit to whom another AFATDS unit would send unsupportable missions and MFRs. This is the unit that provides your unit with the fire support functions to achieve you unit's mission.

APPENDIX K
WINDOWS

K.1 Communication/Network Windows

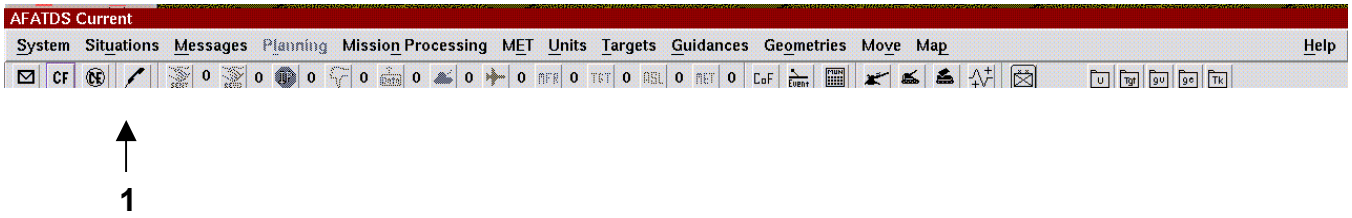

Figure 19. Current Situation Menu Bar

Communications Workspace Icon (1): Selecting this icon on the current situation menu bar displays the current networks and unit configuration window. This window allows the leader to determine what networks the system is currently using and their status and what systems the AFATDS is talking to and how it is talking to them. See Figure 20 and 21.

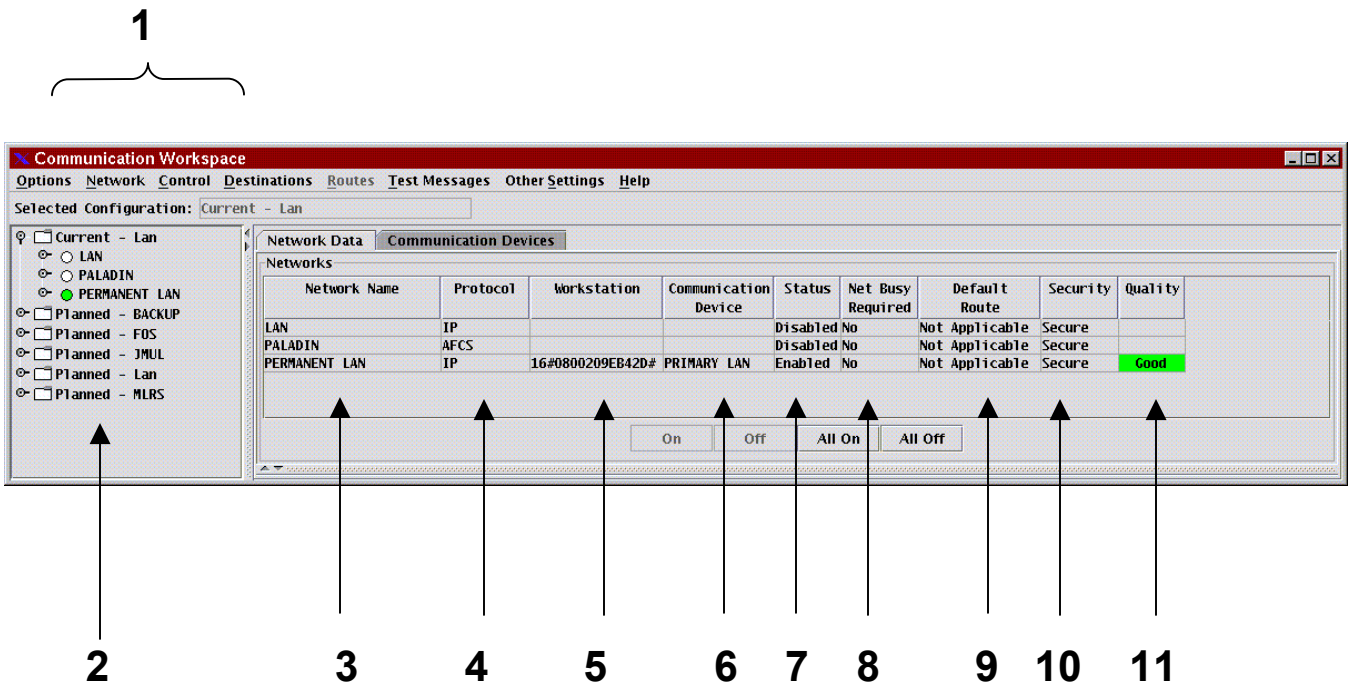

Figure 20. Communications Networks Workspace Window

K.2 Communication Workspace (Networks and Destinations) Window

The Communication Workspace (Networks and Destinations) Window (Figure 20) provides the status of all means of communication media on which the system is talking and the status of the Destination units. The Communication Workspace window displays the name of the current Communication configuration. Multiple planned configurations can be saved and selected at any given time.

K.3 Window Drop Down Menus

- Options:
- Network
- Control
- Destinations
- Routes
- Test Messages
- Other Settings
- Help

Current Configuration: navigation tree, a **Planned Configurations** list (2)**.**

Network Name display section lists the names of the networks that have been built into the displayed communications configuration. PERMANENT LAN and user input names are listed here (3).

Protocol display window (4)

- IP, A220, I220, IP FSTL
- TACFIRE, AFCS, VMF, NATO, EPLRS, FCS, GDU and MCS.

NOTE

See Appendix D for Protocol supporting media and communications settings

Workstations display window (5): displays the workstation name entered on initialization.

Communication Device (6) displays the ID for the communications device to which the network is assigned.

Status window (7) displays enabled, disabled or suspended.

Net Busy Required (8) Identifies if the network supports the net busy functionality

Default Router window (9) displays what network in the configuration is using the default router.

Security display window (10) displays Secure or Clear.

Quality display window (11) field displays the relative quality of the network. The quality is described by a color. The colors are Green (highest quality), Yellow (lowest quality), Red (operational), and Black (not operational).

NOTE

The quality displayed is based on the latest transmissions and may not reflect the current quality.

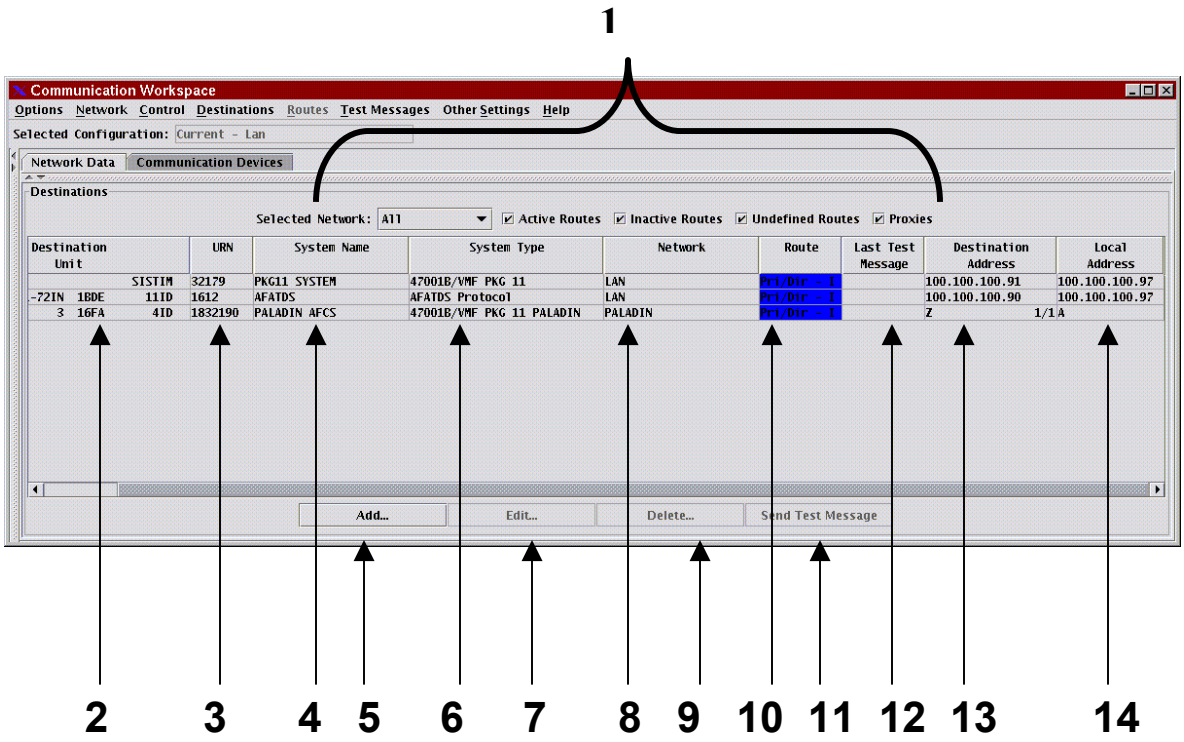

Figure 21. Communication Workspace Destination Unit Window

K.4 Communication Workspace Destination Unit Window

Knowing the Communication Workspace Destination Unit Window makes it easier to obtain the status of units with which you are communicating.

The communication destination unit window shows all destination associated with the selected communication configuration or a filtered view based on the selection of a network from Filter Panel bottons.

Filter Panel (1) contains the route filters that are to be applied against the destination tables destination units. Active routes direct the display of destinations with active routes. Inactive routes direct the display of destinations with inactive routes. Undefined direct the display of destinations with no assigned routes. Proxies direct the display of destinations with proxy routes.

Destination Unit (2) field displays AFATDS unit, from the MUL, with whom the OPFAC has the intention of communicating. This column has an associated drop down menu.

URN (3) displays the Unit identification code associated with the destination unit.

System Name (4) displays the system name for the destination unit.

Add (5) button opens a select unit window for adding a new destination to the communication configuration.

System Type (6) displays the system type for the destination unit.

Edit (7) button opens up the edit routes window for the selected destination.

Network (8) displays the name of the networks associated with a particular communication configuration.

Delete (9) button deletes all selection for the specified destination unit from the communication configuration.

Route (10) column displays a color code to indicate active or inactive routes. (Pri/Dir, Sec/Dir, Sec/Indir, blank, etc.

Send Test Message (11) button when activated a test message will be sent to all highlighted subscribers.

Last Test Message (12) displays the results of the last test message that was sent to the unit for the route in its row

Destination Address (13) displays the units associated destination network address.

Local Address (14) displays the units associated local address of the AFATDS on the network it is on.

APPENDIX L
FIRES AND EFFECTS BASIC LOGIC

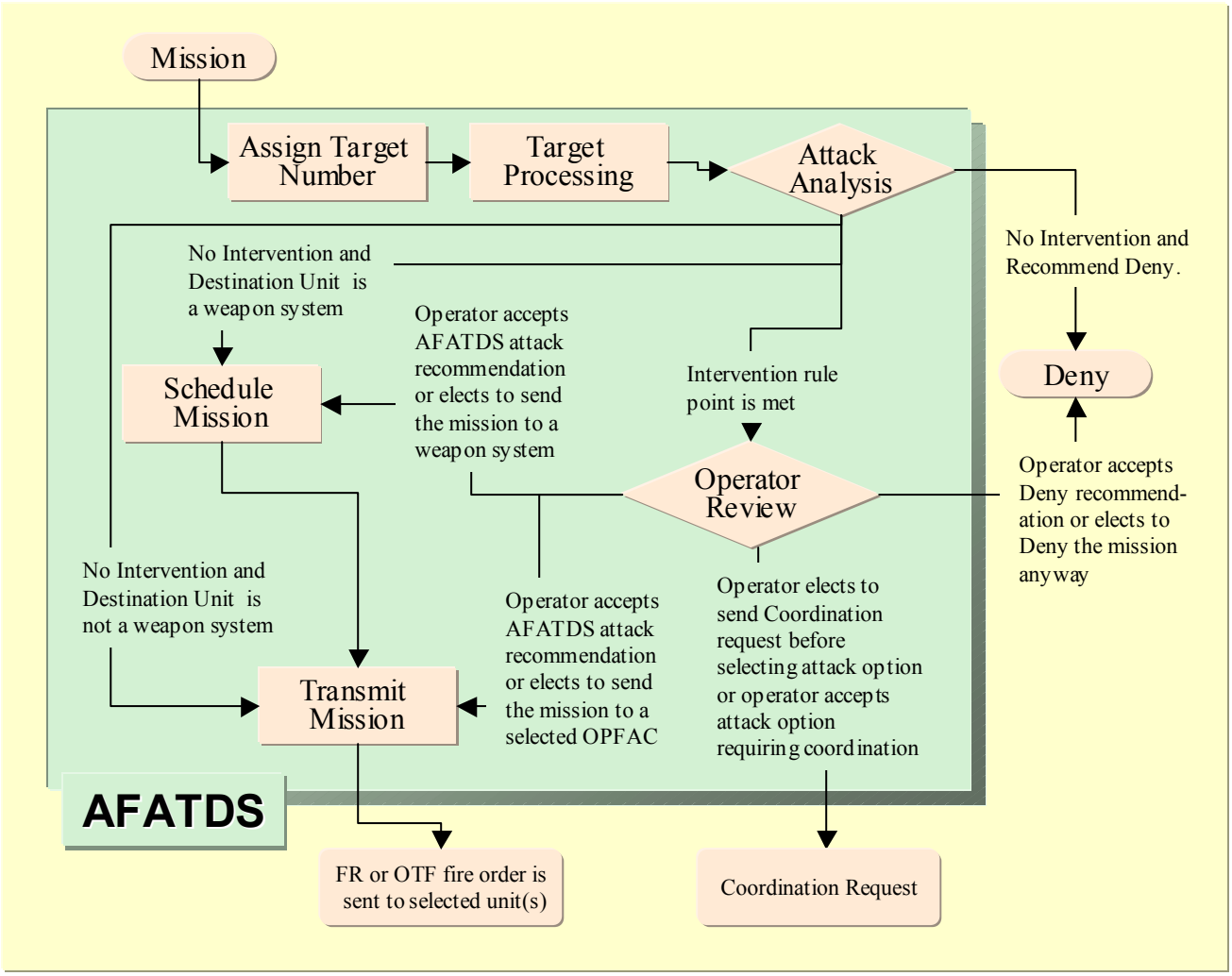

Figure 22. Fires and Effects Basic Logic